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THE NEW ENCYCLOPÆDIA

THE BALKAN QUESTION.

THE Balkan peninsula, which has for centuries been the theatre of turmoil and strife, may be taken as the territory enclosed between the northern boundaries of Bosnia, Servia, and Rumania, the western boundary of Bosnia and Hertzegovina and the sea. The readjustments of 1913, which need not be taken as final, are, for the moment, the last of a series of changes in the fates of the Balkan countries: Bosnia, Servia, Rumania, Montenegro, Albania, Greece, Bulgaria, and European Turkey.

The history of the Balkans since the early part of last century has been the history of a gradual shrinkage in Turkish power and (with one exception, Bosnia and Hertzegovina) the gradual liberation of the different States. Greece secured her independence in 1829, but, with the exception of Greece, the Turkish power was paramount in the Balkan peninsula until 1878. The Russo-Turkish War was concluded by the *Treaty of San Stefano* (March 1878), which would have left Turkey only Albania and Thrace. Bulgaria was to hold Macedonia and Eastern Rumelia as a practically independent state, Servia and Montenegro were to be enlarged and become absolutely independent.

The terms of the Treaty of San Stefano were considerably modified by the *Treaty of Berlin* (July 1878), which recognized the independence of Montenegro and gave her a strip of coast-line, recognized the independence of Servia and Rumania, and granted to Austria-Hungary the occupation and administration of Bosnia and Hertzegovina, with the right to keep garrisons and have military and commercial roads in the Sanjak of Novi-bazaar. Bulgaria became an autonomous but tributary principality, with the Balkans as boundary. The province of Eastern Rumelia became part of Bulgaria in 1885; on October 5, 1908, Austria-Hungary proclaimed her sovereignty over Bosnia-Hertzegovina and Bulgaria declared her independence. Turkey had shrunk to Albania, Macedonia, and Thrace, with the Sanjak of Novi-bazaar separating Servia and Montenegro in the north-west.

Such was the condition of the Balkan peninsula when the Turko-Balkan War broke out. When early in the war Albania seemed to be imperilled, the two Powers most interested—Austria-Hungary and Italy—made it clear that none of the Balkan States would be allowed to take the province as a whole, and that Servia would not be allowed even a port on the Adriatic. A conference of Ambassadors met, at the suggestion of Sir Edward Grey, in London

(December 1912), to consider the future of that province, and it was announced on August 11, 1913, that the southern boundary of the future autonomous Albania had been fixed as a line drawn south of Cape Stylos to Lake Ochrida, leaving the district of Koritza to Albania, but giving part of Albania to Greece.

The other crux of the new Balkan settlement was the Turko-Bulgarian frontier, which had been settled broadly by the *Treaty of London* (May 30) as a line from Enos on the Ægean to Midia on the Black Sea. When Bulgaria was beaten in her ambitious bid for the lion's share of the spoils of the Turko-Balkan War, and compelled to accept terms at the point of the sword of her former allies and Rumania, Turkey chose to place a more than liberal interpretation on the Enos-Midia agreement, suggesting that the boundary should follow the Maritza River from Enos to Adrianople, cross to Kirk-Kilisse (including both fortresses) and so to Midia. It seems probable that the final Turko-Bulgarian boundary will be something like this, and the map given in the *Turko-Balkan War* article must be changed accordingly.

According to the *Treaty of Bukharest*, the other boundaries agreed upon are as follows: The Servo-Bulgarian boundary rises from the old frontier of the Partarica Mountains, follows the old Turko-Bulgarian frontier and the watershed between the Vardar and the Struma (leaving, however, the upper valley of the Strumnitza to Servia), and terminates on the crest of Mt. Belashictza, on the Greco-Bulgarian frontier. This starts from the Servo-Bulgarian frontier and terminates at the mouth of the Mesta, *i.e.* some distance to the east of Kavala. The Rumano-Bulgarian boundary starts at the Danube above Turtukai, and ends on the Black Sea south of Ekrenc. The area of Bulgaria, 37,000 sq. miles before the war, has increased by between one-third and one-fourth.

The Servo-Grecian boundary runs south-west from the Mt. Belashictza to the Vardar at Gyevgeli, and, continuing south-west a little farther, then bends almost due west to the northern end of Lake Presba and the Greco-Albanian boundary. The Sanjak of Novi-bazaar thus falls to Servia and the lion's share of the spoil. Her territory, 18,650 sq. miles before the Turko-Balkan War, is now almost doubled.

The boundaries of Greece are the Servo-Grecian and Albanian southern limits. Salonika and Kavala she has gained despite all protests, and her seaboard, already great, is considerably increased.

Montenegro apparently has gained prestige only.

THE NEW ENCYCLOPÆDIA

EDITED BY H. C. O'NEILL

EDITOR OF 'THE PEOPLE'S BOOKS'

**ASSISTED BY A STAFF
OF SPECIALISTS**

**LONDON: T. C. & E. C. JACK, 67 LONG ACRE, W.C.
AND AT EDINBURGH**

1914

EDITOR'S NOTE

EVERY encyclopædia consists of two elements, one ready-made and the other creative. It is impossible to evolve the framework, manufacture the categories of understanding, or create the labels which are fixed to departments of knowledge. The work of an encyclopædia is to take all these hot from the mint of current thought and appraise them at their just valuation. This appraisal is the creative element, and in the wisdom with which it is carried out lies the claim of an encyclopædia to exist.

Of course one might blunder in employing an old currency. Georgian coins are still seen, but they have an interest and value quite other than those of daily use. An encyclopædia would be of little value indeed if it did not deal with the terms which daily emerge in speech and writing. It is hoped that even in this respect *The New Encyclopædia* marks an advance by the inclusion of terms which represent questions of the moment even though they be of but temporary interest.

Granting that *The New Encyclopædia* has fulfilled its initial task of choosing its labels aright, there remain two opposite tendencies which must be adjusted in the treatment of them. There is the tendency to keep subjects whole and the tendency to dismember them to facilitate reference. An attempt has been made in this volume to drive a somewhat shrewder bargain between them. The subdivisions of a subject, each with its separate heading, are generally arranged under the title of the main article, but cross references are inserted where a reader might naturally expect to find the subdivision. Thus life and its processes, growth and reproduction, are expounded under the general heading 'Animals'; but there is a cross reference to 'Life' in its proper position in the book, and the subdivisions of the main article are marked out by bold headings, only less arresting than the title of the article.

The articles have been written by a numerous band of specialist contributors, not the least part of whose work has been the compression of vast subjects into narrow limits. The most recondite subjects could be represented by a series of formulæ, if a sufficiently rigid set of symbols could be agreed upon; and it is certain that the effective part of knowledge or valid hypothesis in any given subject might be represented by an extremely small proportion of the words generally spent on expressing it.

Compression, and very rigid compression, has thus a decided advantage which has naturally been laid under fee. Words in *The New Encyclopædia* have generally been hoarded with miserly care, the only provision being that at no time should clearness be sacrificed. It would have been easy to compress still more if this provision had not been enforced. The Editor has striven, and he thinks successfully, to use no abbreviation the meaning of which is not at once obvious. At the same time a host of connecting words of which exponents are usually so spendthrift have been suppressed.

Another source of wastage of space which has been avoided in *The New Encyclopædia* is excessive reduplication. An invention which justifies the inclusion of a biography may thus be described several times: under the inventor's name, under the branch of the subject which it advances, under the general heading of the subject, etc. A wide use of cross references has done away with this wholly unnecessary waste.

Specialist and contracted treatment have both been bent to this one end, to present a clear story to the reader ; so that while the student will find the articles inspired by the most careful scholarship, the uninitiated will be able to read with interest and understanding. Science and philosophy, in which the 'average man' is legitimately so intensely interested, are both expounded so far as is possible in the language of ordinary speech.

By the employment of a very large body of specialist contributors and a wide editorial control it is hoped that a greater than usual modernity of treatment has been secured. Thus, scientific developments the most recent have been chronicled side by side with the events which have but now happened.

The system of employing specialists has been carried to its legitimate conclusion, by employing them for articles which usually form the subject of controversy. Thus it has seemed fairer and a nearer approach to the objective treatment of the scientific articles to have the article on 'Free Churches' written by a Free Church clergyman, and the article on 'Roman Catholicism' by a Roman Catholic priest. The criticisms of such subjects are fairly obvious, while the point of view can only be justly given by the specialist, in this case the believer. But where it has been possible, the purely objective point of view has been maintained.

Illustrations have been given where necessary or where they effected a saving in space ; but since no maps could pretend to give all the places to which reference has been made—as many as in most large gazetteers—the latitude and longitude of places have been given so that any one can see on referring to a map exactly where the place lies.

Names are such as are generally used, except where, in foreign names, another and equally simple but more correct transliteration has been found. The common English version has in such cases been cross-referenced. 'Mahomet' in this way has been abandoned in favour of the more correct 'Muhammad.' But where a name or a system of transliteration has established a sort of prescriptive right to survive, it has been used with the more correct version given as an alternative. The advantage of consistency has been sacrificed where its maintenance would have lessened the availability of the encyclopædia.

The numerous hands through which *The New Encyclopædia* has passed have added much to its general efficiency in suggesting to the Editor points of view not sufficiently elucidated, or given differently in different articles, and to all his editorial assistants the Editor owes a debt of gratitude.

Though a distinct and very high ideal has inspired the choice of articles, arrangement, and method of *The New Encyclopædia*, the Editor feels confident that this has met with a measure of realisation.

H. C. O'NEILL.

ABBREVIATIONS USED IN THIS WORK

abp., archbishop.
Amer., American.
anat., anatomy.
app., appointed.
Arab., Arabian.
arch., architecture.
astron., astronomy.

b., born.
biol., biology.
bot., botany.
B.P., Boiling-point.
bp., bishop.
Brit., British.
bro., brother.

c., about (*Lat. circa*).
cent., century.
cf., compare.
chem., chemistry.
Chin., Chinese.
class., classical.
coll., college.
cr., created.

d., died.
Dan., Danish.
dau., daughter.

E., East.
e., eldest.
ed., educated.
edit., editor, edited, edition.
e.g., for example.
Eng., English.

f., father.
fl., flourished.

Flem., Flemish.
Fr., French.

geol., geology.
geom., geometry.
Ger., German.
Gk., Greek.
gov., governor.
gov.-gen., governor-general.
grad., graduated.

hist., historical.

Ind., Indian.
in., inches.
Ital., Italian.

Jap., Japanese.

Lat., Latin.
lieut.-gen., lieutenant-general.
lit., literature.

m., married.
M.E., Middle English.
M.P., Member of Parliament.
Melting-point.
maths., mathematics.
med., medicine.
min., mineralogy.
mts., mountains.
myth., mythology.

N., North.
Norweg., Norwegian.

O.E., Old English.

Pers., Persian.
Pop., Population.
Portug., Portuguese.
Pres., President.
prof., professor.
Prot., Protestant.
Pruss., Prussian.
pub., published.

q.v., which see.

R.C., Roman Catholic.
Rom., Roman.
Russ., Russian.

S., South.
s., son.
Scot., Scottish.
sec., secretary.
S.G., Specific Gravity.
Soc., Society.
Span., Spanish.
sq., square.
succ., succeeded.
Swed., Swedish.

theol., theology.
trans., translation, translated.
Turk., Turkish.

U.K., United Kingdom.
univ., university.

vols., volumes.

W., West.

zool., zoology.

THE NEW ENCYCLOPÆDIA

A, initial letter of Eng. alphabet, corresponding to *Alpha* in Greek and *Aleph* in Hebrew. In O.E. it was sounded long and short only, as 'balm' and 'ask'. Nowadays it has eight sounds, as in 'balm,' 'ask,' 'pale,' 'rare,' 'flat,' 'fall,' 'was,' 'many.'

AA, numerous European rivers: 1 (50° 47' N., 2° 13' E.), N. France; 2 (40° 52' N., 8° 23' E.), Switzerland; 3 (51° 38' N., 5° 32' E.), Holland; 4 (57° 15' N., 24° 45' E.), Russia; others in Germany and Russia.

AACHEN, AIX-LA-CHAPELLE (50° 40' N., 6° 8' E.), town, Prussia; capital of empire of Charlemagne, who is buried there; treaties signed at A., 1688 (giving Flanders to France) and 1748 (ending War of Austrian Succession); coal-fields and manufactures; sulphur baths. Pop. (1910) 158,000.

AAL, AL, Hindustani for plant *Morinda citrifolia*, and for the reddish dye obtained from its roots.

AALBORG (57° 2' N., 9° 52' E.), seaport, Denmark; exports fish, grain. Pop. (1911) 33,500.

AALÉN (48° 50' N., 10° 5' E.), town, Württemberg; ironworks. Pop. (1910) 11,500.

AALESUND (62° 28' N., 6° 5' E.), seaport, Norway; herring fisheries. Pop. (1910) 14,000.

AALIPASHA (1815-71), Turk. politician; five times grand vizier.

AALMEER (52° 14' N., 4° 44' W.), town, Holland.

AAR(E) (47° 30' N., 8° 13' E.), large Swiss river; joins Rhine at Coblenz; nearly 200 miles long.

AARAU (47° 24' N., 8° 2' E.), capital of Aargau, Switzerland; foundries. Pop. 8000.

AARD-VARK (earth-pig), Dutch name for African edentate mammal of genus *Orycteropus*, burrowing in ground and feeding on ants, which it catches with its slimy, extensible tongue.

AARD-WOLF (earth-wolf), Dutch name for *Proteles cristatus*, a S. African hyena-like mammal with an erectile mane, of burrowing habits, feeding on carrion and white ants.

AARGAU (47° 25' N., 8° 10' E.), N. Swiss canton; area, 542 sq. miles; admitted Swiss Confederation, 1803; capital, Aarau. Pop. (1910) 230,000.

AARHUS (56° 11' N., 10° 12' W.), Dan. seaport; old Gothic cathedral. Pop. (1911) 62,000.

AARON, the bro. of Moses, is prominent in some parts of the narrative of the Exodus and Wanderings, but his importance varies considerably in different strata of the tradition. In the earlier narrative, J and E, he is represented as acting with Moses, but in such a way that some think his name is an editorial insertion. A stays with the Israelites when Moses and Joshua go up the mountain for the tablets and the Law, and A. makes the Golden Calf (under which

form Jahweh was probably worshipped in early times). In the later traditions, those of the Priestly Code, A. is much more prominent. Like his bro., he receives the divine commands, and he appears definitely as high priest, performing all the ceremonies of his office. This characterisation of him must be post-exilic, when the priestly system was established. It is very difficult, if not impossible, to say what amount of hist. information we really have about him, but in any case he is more shadowy than Moses. One authority thinks he is a 'traditional head of the priesthood and cult of Bethel.' He is certainly connected with the priesthood, and the Aaronites and the rest of the Levites are distinguished. The etymology of the name is obscure, and may have been taken over by the Hebrews from some of their Canaanitish or N. Arab. neighbours.

AARON'S BEARD, popular name for several plants having some fanciful resemblance to a beard, e.g. strawberry geranium, rose of Sharon, Kenilworth ivy, etc.

AARON'S ROD, name for various tall flowering plants, like the golden rod; (arch.) rounded moulding with scrollwork or leafage.

A.B., see ABBREVIATIONS.

AB, 11th month of Jewish civil year. See CALENDAR.

ABA, coarse goat- or camel-hair homespun of Near East; loose, sleeveless outer garment made from this cloth, worn by Arabs; an altazimuth instrument.

ABABDA, large tribe of Arab nomads in Egypt and Nubia, chiefly occupied in carrying trade, and, from earliest times, as caravan guides.

ABABDEH (27° 43' N., 30° 56' E.), town, Egypt.

ABACA (*Musa textilis*), native name of plant from which manila hemp is produced.

ABACO, GREAT (26° 30' N., 77° 10' W.), one of Bahama Islands. Pop. 4500.

ABACTINAL, see ACTINAL.

ABACUS, upper part of capital of a column, supporting architrave; also from Rom. times frame with beads running on wires, used for calculating.

ABADDON, Apollyon, angel of the underworld; also Hell itself.

ABADEH (31° 10' N., 52° 35' E.), town, Persia; noted for wood-carving. Pop. 4000.

ABAE, ancient town, Phocis, Greece; had oracle; ruined.

ABAKANSE (54° 20' N., 91° 40' E.), town, Siberia. Pop. 2000.

ABALONE, Californian name for *Haliotis*, or ear-shell, a shell-fish known in Channel Islands as *ormer* (*oreille de mer*).

ABAMA, genus of bog plants. See *ASPHODEL*.
ABANA (Barada), river in plain of Damascus.
ABANO BAGNI (45° 22' N., 11° 46' E.), town, Italy; hot springs. Pop. 5000.
ABANO, PIETRO DI (1250-1316), Ital. physician and astrologer; tried by Inquisition but d. before sentence.
ABANTO (43° 20' N., 3° 10' W.), town, Spain; iron-ore mines. Pop. 7000.
ABARBANEL (1437-1508), name assumed by Isaac ben Jehudah, Span. Jew, diplomatist, philosopher, and commentator; diplomatic agent of Alfonso V. (Portugal).
ABARIM (31° 40' N., 35° 40' E.), mountain chain, Palestine.
ABARIS, priest of Apollo, from whom he is supposed to have received a magic arrow giving him powers of locomotion; lived either VIII. or VI. cent. B.C.
ABASIA, lack of power to control muscles in walking.
ABATED, ancient term applied to sunk portions of masonry; also blunted, as 'a. arms.'
ABATEMENT, act of mitigation, reduction, removal, etc.; heraldic mark of dishonour.
ABAT-JOUR (Fr.), shade, screen, or other contrivance over windows, etc., for throwing light downwards.
ABAT-SONS (Fr.), contrivance for throwing sound downwards.
ABATTIS, rampart of felled trees, with branches extending outwards.
ABATTOIR, public slaughter-house (g.v.).
ABAT-VENT (Fr.), contrivance for keeping out wind on belfries, chimney-cans, etc.
ABAUZIT, FIRMIN (1679-1767), Fr. philosopher and scholar and Prot. theologian; b. Uzès, Languedoc; sought refuge in Geneva after Revocation of Edict of Nantes.
ABBA, see *ABBOT*.
ABBADIDES, Muhammadan dynasty in Spain (1023-91); founded by Abd-ul-Qasim Muhammad, Cadi of Seville, head of Arab family long settled there.
ABBADIE, ANTOINE THOMSON D' (1810-97), and **ARNAUD MICHEL D'** (1815-93), two brothers, b. Dublin of French-Irish parentage, famous for their travels in Abyssinia (1837-48).
ABBADIE, JACQUES (1658-1727), Prot. theologian, minister of Fr. Church in London; then Dean of Killaloe.
ABBAS, see *ABBASIDES*.
ABBAS I. (1557-1628), 'the Great'; Shah of Persia, constitutional reformer.
ABBAS I. (1813-54), Egyptian pasha; murdered.
ABBAS II. (1874-), Khedive of Egypt; succ. f. when eighteen; progressive ruler.
ABBASIDES (Caliphs of Bagdad from 750-1258), second of the two great dynasties of the Muhammadan Empire; claimed descent from Abbas (A.D. 566-652), Muhammad's uncle.
ABBAS-TUMAN (41° 40' N., 42° 30' E.), watering-place in Russ. Transcaucasia; sulphur baths.
ABBATE, NICCOLO DELL', 'Messere NICCOLO', (1515-71), Ital. fresco painter; assisted in decorating Fontainebleau.
ABBAZIA (45° 20' N., 14° 18' E.), town, Istria, Austria; popular resort.
ABBE, CLEVELAND (1838-), Amer. meteorologist; inaugurated daily weather forecasts based on telegraphic reports (c. 1869); official govt. meteorologist, 1870; commenced official *Monthly Weather Review*, 1873; wrote *Treatise on Meteorological Apparatus and Methods* (1887).
ABBESS, feminine of 'abbot'; one who presides over abbey or nunnery. See *MONASTERY*.
ABBEVILLE (50° 5' N., 1° 48' E.), town, N. France; has old churches; manufactures cloth. Pop. 19,000.
ABBEY, conventual establishment with an abbot or abbess at the head. See *MONASTERY*.
ABBEY, EDWIN AUSTIN, R.A. (1852-1911), Amer. artist; b. Philadelphia; painter of dramatic subjects, and book-illustrator.

ABBEYFEALE (52° 25' N., 9° 23' W.), village, County Limerick, Ireland.
ABBEYLEIX (52° 55' N., 7° 21' W.), village, S. Queen's County, Ireland; flour mills.
ABBIATEGRASSO (45° 25' N., 8° 54' E.), town, Lombardy, Italy; silk. Pop. 11,000.
ABBON (850-923), Fr. monk of St. Germain-des-Prés; wrote valuable account in Latin verse of siege of Paris by Normans.
ABBON OF FLEURY (d. 1004), Fr. chronicler.
ABBOT, derived from Syriac *Abba*, signifying Father, though originally a title of much more extended meaning, has come now to represent the superior of an autonomous community of monks. Elected in most cases by his community, he possesses, usually for life, the supreme rule of the abbey. The importance of the office was so far evident that A's attended General Councils of the Church and sat in national Assemblies of England, France, Germany, etc. Their powers are quasi-episcopal; and, though they are not consecrated, at the ceremony of their blessing they receive from their diocesan bp. the mitre, crozier, ring, etc., as the formal insignia of their office.
ABBOT OF MISRULE or UNREASON (g.v.).
ABBOT, EZRA (1819-84) Amer. Biblical scholar; Bussey Prof. of New Testament Criticism at Harvard, 1872-84.
ABBOT, GEORGE (1662-1633), Abp. of Canterbury; b. Guildford; one of translators of the Bible (1604); ardent Calvinist, and enemy of Laud, his successor.
ABBOT, GEORGE (1603-48), Eng. Puritan author and scholar.
ABBOT, WILLIAM (1789-1843), Eng. actor and dramatist.
ABBOTS-BROMLEY (52° 45' N., 1° 50' W.), village, Staffordshire, England.
ABBOTSFORD, residence of Sir Walter Scott, on Tweed, near Melrose.
ABBOTSHALL (56° 15' N., 3° 10' W.), parish, Kirkcaldy, Fifeshire.
ABBOTS-LANGLEY (51° 40' N., 0° 25' W.), hamlet, Hertfordshire, England.
ABBOTT, EDWIN ABBOTT (1838-), Eng. scholar and theologian; *Shakespearean Grammar*, and other works.
ABBOTT, EMMA (1849-91), Amer. operatic singer; studied Milan and Paris, made début as Maria in *La Fille du Regiment* at Covent Garden; sang later in U.S.A. with *English Opera Company*.
ABBOTT, EVELYN (1843-1901), classical scholar.
ABBOTT, LEMUEL FRANCIS (1760-1803), Eng. painter.
ABBOTT, LYMAN (1835-), Amer. author and Congregationalist divine; editor of *Outlook*.
ABBOTTABAD (34° 7' N., 73° 12' E.), town, India; military cantonment. Pop. 7784.
ABBREVIATIONS, the list of abbreviations or contractions used in this volume will be found in the Introduction. The following 'A's' are in common use:—
A.B. (*L. Artium Baccalaureus*), Bachelor of Arts (also *B.A.*); able-bodied seaman.
Abp., Archbishop.
A.C. (*L. ante Christum*), before Christ.
a/c., account.
A.C.A., Associate of Chartered Accountants.
A.C.P., Associate of the College of Preceptors.
A.C.S., Additional Curates' Society; Anglo-Continental Society.
A.D. (*L. anno Domini*), in the year of our Lord.
A.D.C., Aide-de-camp.
Ad lib. (*L. ad libitum*), at pleasure.
et. (*L. etatis*), in the year of his age.
A.F.A., Associate of the Faculty of Actuaries.
A.G., Adjutant-General.
Ag. (*L. argentum*), silver.
A.H. (*L. anno Hegiræ*), in the year of the Hegira (the Muhammadan era).

A.I.A., Associate of the Institute of Actuaries.
 A.I.C., Associate of the Institute of Chemistry.
 Assoc.Inst.C.E., Associate of the Institute of Civil Engineers.
 Ala., Alabama, U.S.A.
 Alas., Alaska, U.S.A.
 A.L.S., Associate of the Linnæan Society.
 A.M. (*L. anno mundi*), in the year of the world;
 (*L. ante meridiem*) before noon; see also *M.A.*
 A.M.Inst.C.E., Associate Member of the Institution of Civil Engineers.
 A.M.S., Army Medical Staff.
 Anon., anonymous.
 A.O.D., Ancient Order of Druids.
 A.O.F., Ancient Order of Foresters.
 A.O.H., Ancient Order of Hibernians.
 A.P.U.C., Association for the Promotion of the Unity of Christendom.
 Aq. (*L. aqua*), water.
 A.Q.M.G., Assistant Quartermaster-General.
 A.R.A., Associate of the Royal Academy.
 A.R.A.M., Associate of the Royal Academy of Music.
 A.R.C.E., Academical rank of Civil Engineers.
 Arch., Archdeacon.
 A.R.C.S., Associate of the Royal College of Science.
 A.R.H.A., Associate of the Royal Hibernian Academy.
 A.R.I.B.A., Associate of the Royal Institute of British Architects.
 Ariz., Arizona, U.S.A.
 Ark., Arkansas, U.S.A.
 A.R.S.A., Associate of the Royal Scottish Academy.
 A.R.S.M., Associate of the Royal School of Mines.
 A.S., Anglo-Saxon; in the year of our salvation.
 A/S., account sales.
 A.S.C., Army Service Corps.
 A.T.&S.F.Ry., Atchison, Topeka, and Santa Fé Railway.
 Atty.-Gen., Attorney-General.
 A.U.C. (*L. ab urbe condita*), from the building of Rome.
 A.V., Authorised Version of the Bible.
 A.V.D., Army Veterinary Department.
 B.A., Bachelor of Arts (also *A.B.*).
 B.&F.B.S., British and Foreign Bible Society.
 B.&O.R.R.Co., Baltimore and Ohio Railway Co.
 B.A.O., Bachelor of the Art of Obstetrics.
 Bt., or Bt., Baronet.
 B.C., before Christ; British Columbia.
 B.Ch., Bachelor of Surgery.
 B.Ch.D., Bachelor of Dental Surgery.
 B.C.L., Bachelor of Civil Law.
 B.C.S., Bengal Civil Service.
 B.D., Bachelor of Divinity.
 B.D.S., Bachelor of Dental Surgery.
 B.Eng., Bachelor of Engineering.
 B.L.L., Bachelor of Laws (also *LL.B.*).
 b/l., bill of lading.
 B.M., Bachelor of Medicine.
 B.Met., Bachelor of Metallurgy.
 B.Mus., Bachelor of Music (also *Mus.Bac.*)
 Bp., Bishop.
 Brig.-Gen., Brigadier-General.
 Brit., Britain, Britannia, Briton, British.
 B.S., Bachelor in Surgery.
 B.Sc., Bachelor of Science.
 B.S.L., Botanical Society, London.
 Bt., Baronet.
 B.Th., Bachelor of Theology.
 B.Th.U., British Thermal Unit.
 B.T.U., Board of Trade Unit.
 B.V.M. (*L. Beata Virgo Maria*), Blessed Virgin Mary.
 C., cent, centigrade, centime; (*L. circa*) about.
 C.A., Chartered Accountant.
 Cal., California, U.S.A.
 C.&N.W.Ry., Chicago and North-Western Railway.
 Cantab. (*L. Cantabrigiensis*), of Cambridge.

Centuar. (*L. Cantuariensis*), of Canterbury. (The Primate of all England uses *Cantuar* as his surname.)
 C.Ass., Church Association.
 C.Aug.F., Curates' Augmentation Fund.
 C.B., Companion of the Bath.
 C.B.&Q.Ry.Co., Chicago, Burlington, and Quincy Railway Company.
 C.B.F., Colonial Bishoppria Fund.
 C.C., County Councillor; County Council.
 C.E., Civil Engineer.
 Cel., Celsius (thermometer).
 cent. (*L. centum*), a hundred.
 C.E.T.S., Church of England Temperance Society.
 C.E.W.H.S., Church of England Women's Help Soc.
 C.E.W.M.S., Church of England Working Men's Soc.
 C.E.Z.M.S., Church of England Zenana Missionary Society.
 cf. or op. (*L. confer*), compare.
 C.G., Coast-guard; Commissary-General.
 C.G.S., the units of length, mass, and time (centimetre, gramme, second) used in scientific work.
 C.G.U., Church Guilds Union.
 C.I., Order of the Crown of India.
 C.I.D., Criminal Investigation Department.
 C.I.E., Companion of the Order of the Indian Empire.
 C.I.V., City Imperial Volunteers.
 C.L.B., Church Lads' Brigade.
 C.L.C.R., Cheshire Lines Committee Railway.
 C.L.R., Central London Railway.
 cm., centimetres.
 C.M., Certificated Master; (*L. Chirurgia Magister*) Master in Surgery; common metre.
 C.M.&St.P.Ry., Chicago, Milwaukee, and St. Paul Railway.
 C.M.G., Companion of the Order of St. Michael and St. George.
 C.M.S., Church Missionary Society.
 Co., Company; county.
 C.O., Commanding Officer; Colonial Office.
 c/o, care of.
 C.O.D., cash on delivery.
 Col., Colonel.
 Coll., College.
 Colo., Colorado, U.S.A.
 Com., Commander; Commissioner; Commodore.
 con. (*L. contra*), against.
 Conn., Connecticut.
 Cor. Mem., Corresponding Member.
 Cor. Sec., Corresponding Secretary.
 C.O.S., Charity Organisation Society.
 C.P., Clerk of the Peace; Common Pleas.
 C.P.A.S., Church Pastoral Aid Society.
 C.P.R., Canadian Pacific Railway.
 C.P.S. (*L. Custos Privati Sigilli*), Keeper of the Privy Seal.
 cr., credit, creditor.
 C.R. (*L. Custos Rotulorum*), Keeper of the Rolls; Caledonian Railway; Cambrian Railway.
 Cres., Crescendo (Musical).
 C.R.I.&P.Ry., Chicago, Rock Island, and Pacific Railway.
 C.S., Chemical Society; Civil Service; Clerk to the Signet; Court of Session.
 C.S.L., Companion of the Star of India.
 C.S.L.R., City and South London Railway.
 C.S.U., Christian Social Union.
 C.T., Certificated Teacher.
 C.T.C., Cyclists' Touring Club.
 C.T.S., Catholic Truth Society.
 curt., current; the present month.
 C.V.O., Commander of the Royal Victorian Order.
 cwt. (*c* = *L. centum*; and *wt.* = *Eng. weight*), a hundredweight.
 d. (*L. denarius*), a penny.
 D.A.R., Daughters of the American Revolution.
 D.C. (*It. da capo*), from the beginning; again (Musical); District of Columbia, U.S.A.

ABBREVIATIONS

- D.C.L., Doctor of Civil Law.
D.D. (*L. Divinitatis Doctor*), Doctor of Divinity.
D.D.D. (*L. Dat, donat, dicatque*), 'he—the donor—gives this, presents and dedicates it.' Letters often written after the name of a donor, on a stylet.
Def., Defendant.
Del., Delaware; (*L. delineavit*) he (or she) drew it.
D.Eng., Doctor of Engineering.
D.F., Dean of the Faculty; Defender of the Faith (also *F.D.*).
D.G. (*L. Dei Gratia*), by the Grace of God.
D.Hy., Doctor of Hygiene.
Dim., Diminuendo (Musical).
dis., discount.
D.L., Deputy-Lieutenant.
D.Lit., Doctor of Literature.
D.L.O., Dead Letter Office.
D.M. (*L. Dis Manibus*), 'to the Divine Manes.' Letters at the head of a Roman tombstone.
D.Met., Doctor of Metallurgy.
D.Mus., Doctor of Music. (See *Mus.D.*)
Do. (*It. Ditto*), the same.
D.O., District Office (Postal).
Dols., dollars.
D.O.M. (*L. Deo optimo maximo*), 'to God the best and greatest.'
Dox., dozen.
D.P.H., Diploma of Public Health.
Dr., debtor; doctor.
dr., dram.
D.S. (*It. dal segno*), from the sign.
D.Sc., Doctor of Science.
D.S.O., Companion of the Distinguished Service Order.
D.S.Sc., Diploma in Sanitary Science.
D.T. (*L. Doctor Theologie*), Doctor of Theology.
D.T's, Delirium Tremens.
Dunelm. (*L. Dunelmensis*), of Durham.
D.V. (*L. Deo volente*), God willing.
D.V.H., Diploma in Veterinary Hygiene.
dwt. (*d = L. denarius*, and wt. = Eng. weight), a pennyweight.
- Eblan. (*L. Eblanensis*), of Dublin.
Ebor. (*L. Eboracensis*), of York. (The Archbishop of York uses *Ebor* as his surname.)
E.C., Established Church.
E.C.U., English Church Union.
Ed., Editor.
E.D.S., English Dialect Society.
E.E., Errors excepted.
E.E.T.S., Early English Text Society.
e.g. (*L. exempli gratia*), for example.
Eng., England or English.
Env. Ext., Envoy Extraordinary.
eq., equal.
E.R. (*L. Edwardus Rex*), King Edward.
Esq., Esquire.
E.T., English Translation.
et al. (*L. et alibi*), and elsewhere; (*L. et alii*) and others.
etc. (*L. et ceteri, ceteræ, or cætera*), and others; and so on.
et seq. (*L. et sequentes*), and the following.
Ex.div., exclusive of dividend.
Exec., executor.
Execx., excoatrix.
Exon. (*L. Exoniensis*), of Exeter. (The Bishop of Exeter uses *Exon* as his surname.)
E.&O.E., Errors and omissions excepted.
- F., Fahr., Fahrenheit (thermometer).
f., franc.
F.A., Football Association.
F.A.M., Free and Accepted Mason.
F.A.S., Fellow of the Antiquarian Society.
F.A.S.E., Fellow of the Antiquarian Society (Edinburgh).
F.A.S.L., Fellow of the Antiquarian Society (London).
- F.B.A., Fellow of the British Academy.
F.B.S., Fellow of the Botanical Society.
F.B.S.E., Fellow of the Botanical Society (Edinburgh).
F.C. (*L. fieri curavit*), 'He directed this to be done.' Letters put at the end of a monumental inscription, after the donor's name.
F.C.A., Fellow of Chartered Accountants.
Fop., foolscap.
F.C.P., Fellow of the College of Preceptors.
F.C.P.S., Fellow of the Cambridge Philosophical Society.
F.C.S., Fellow of the Chemical Society.
F.D. (*L. Fides Defensor*), Defender of the Faith (also *D.F.*).
Fec. (*L. fecit*), he (or she) did it.
F.E.I.S., Fellow of the Educational Institute of Scotland.
F.F.A., Fellow of the Faculty of Actuaries.
F.F.P.S., Fellow of the Faculty of Physicians and Surgeons (Glasgow).
F.G.S., Fellow of the Geological Society.
F.H.S., Fellow of the Horticultural Society.
F.I.A., Fellow of the Institute of Actuaries.
F.I.C., Fellow of the Institute of Chemistry.
F.I.Inst., Fellow of the Imperial Institute.
F.J.I., Fellow of the Institute of Journalists.
F.K.Q.C.P.I., Fellow of King's and Queen's College of Physicians, Ireland.
- Fla., Florida.
F.L.S., Fellow of the Linnæan Society.
F.M., Field-Marshal.
F.O., Foreign Office; field-officer.
fo., folio.
f.o.b., goods bought (or sold) to be delivered 'free on board.'
F.P.S., Fellow of the Philological Society.
F.R.A.S., Fellow of the Royal Astronomical Society.
F.R.C.I., Fellow of the Royal Colonial Institute.
F.R.C.P., Fellow of the Royal College of Physicians.
F.R.C.P.E., Fellow of the Royal College of Physicians (Edinburgh).
F.R.C.S., Fellow of the Royal College of Surgeons.
F.R.C.S.Eng., Fellow of the Royal College of Surgeons (England).
F.R.C.S.E., Fellow of the Royal College of Surgeons (Edinburgh).
F.R.C.S.I., Fellow of the Royal College of Surgeons (Ireland).
F.R.C.V.S., Fellow of the Royal College of Veterinary Surgeons.
F.R.G.S., Fellow of the Royal Geographical Society.
F.R.H.S., Fellow of the Royal Horticultural Society.
F.R.Hist.S., Fellow of the Royal Historical Society.
F.R.I.B.A., Fellow of the Royal Institute of British Architects.
F.R.M.S., Fellow of the Royal Microscopical Society.
F.R.Met.Soc., Fellow of the Royal Meteorological Society.
F.R.P.S., Fellow of the Royal Photographic Society.
F.R.S., Fellow of the Royal Society.
F.R.S.E., Fellow of the Royal Society (Edinburgh).
F.R.S.L., Fellow of the Royal Society of Literature.
F.S.A., Fellow of the Society of Antiquaries.
F.S.A.Scot., Fellow of the Society of Antiquaries (Scotland).
F.S.I., Fellow of the Surveyors' Institution.
F.S.S., Fellow of the Statistical Society.
F.T.C.D., Fellow of Trinity College, Dublin.
F.Z.S., Fellow of the Zoological Society.
- Ga., Georgia (United States).
G.A.R., Grand Army of the Republic.
G.B., Great Britain.
G.B.&I., Great Britain and Ireland.
G.C.B., Grand Cross of the Bath.
G.C.H., Grand Cross of the Guelphs of Hanover.

G.C.I.E., Knight Grand Commander of the Indian Empire.
 G.C.L.H., Grand Cross of the Legion of Honour.
 G.C.M.G., Grand Cross of St. Michael and St. George.
 G.C.R., Great Central Railway.
 G.C.S.I., Grand Commander of the Star of India.
 G.C.V.O., Knight Grand Cross of the Royal Victorian Order.
 G.D., Grand Duke (or Duchess).
 G.E.R., Great Eastern Railway.
 G.F.S., Girls' Friendly Society.
 Gib., Gibraltar.
 G.L., Grand Lodge.
 gm., grammes.
 G.M., Grand Master.
 G.M.K.P., Grand Master of the Knights of St. Patrick.
 G.N.R., Great Northern Railway; and Great Northern Railway, U.S.A.
 Gov.-Gen., Governor-General.
 G.P.O., General Post Office.
 G.R. (L. *Georgius Rex*), King George.
 gr., grain.
 Gr., Greek.
 G.S.W.R., Glasgow and South-Western Railway; Great Southern and Western Railway (Ireland).
 G.W.R., Great Western Railway.
 H.A.C., Honourable Artillery Company.
 H.B.M., His (or Her) Britannic Majesty.
 H.C., House of Commons; Herakls' College.
 h.e. (L. *hoc est*), that (or this) is.
 H.E., His Eminence; His Excellency.
 Heb., Hebrew.
 H.G., Horse Guards.
 H.H., His (or Her) Highness; His Holiness (the Pope).
 hhd., hoghead.
 H.I.H., His (or Her) Imperial Highness.
 Hil., Hilary.
 H.I.M., His Imperial Majesty.
 H.J. (L. *hic jacet*), here lies.
 H.J.S. (L. *hic jacet sepultus*), here lies buried.
 H.L., House of Lords.
 h.l. (L. *hoc loco*), in this place.
 H.L.I., Highland Light Infantry.
 H.M., His (or Her) Majesty.
 H.M.C., His (or Her) Majesty's Customs.
 H.M.I.S., His Majesty's Inspector of Schools.
 H.M.S., His Majesty's Service; His Majesty's Ship.
 Hon., Honourable.
 H.P., half-pay; horse-power.
 H.R.H., His (or Her) Royal Highness.
 H.R.I.P. (L. *hic requiescit in pace*), here rests in peace.
 H.S.H., His (or Her) Serene Highness.
 H.S.S., (L. *Historia Societatis Socius*), Fellow of the Historical Society.
 H.W.M., High-water mark.
 Ia., Iowa.
 ib. or ibid. (L. *ibidem*), in the same place.
 I.C.R.R., Illinois Central Railroad.
 I.C.S., Indian Civil Service.
 id. (L. *idem*), the same.
 Ida., Idaho, U.S.A.
 I.D.B., Illinois Diamond Buying.
 i.e. (L. *id est*), that is.
 I.H.S. (more properly IHS or IHC) the first three letters of the name Jesus in Greek.
 Ill., Illinois.
 I.L.P., Independent Labour Party.
 I.M., Isle of Man.
 I.M.D., Indian Medical Department.
 Imp. (L. *Imperator*), Emperor; Imperial.
 I.M.S., Indian Medical Service.
 in., inch.
 Incog. (It. *incognito*, *incognita*), unknown.
 Ind., Indiana.
 inst. (L. *instante*), instant; of the present month.
 Int., interest.
 in trans. (L. *in transitu*), on the way.

inv. (L. *invenit*), he designed.
 I.O.C.I., the Imperial Order of the Crown of India.
 I.O.G.T., Independent Order of Good Templars.
 I.O.O.F., Independent Order of Oddfellows.
 I.O.U., I owe you.
 I.P.D. (L. *in presentia Dominorum*), in presence of the Lords (of Session), Edinburgh.
 i.q. (L. *idem quod*), the same as.
 I.R.O., Inland Revenue Office.
 I.R.R., Irish Royal Rifles.
 I.S.O., Imperial Service Order.
 It., Italian.
 I.W., Isle of Wight.
 I.W.W., Industrial Workers of the World.
 I.Y., Imperial Yeomanry.
 J.A., Judge-Advocate.
 J.C., Jesus Christ.
 J.C.D. (L. *Juris Civilis Doctor*), Doctor of Civil Law.
 J.D. (L. *Jurum Doctor*), Doctor of Laws.
 J.G.W., Junior Grand Warden.
 J.P., Justice of the Peace.
 J.U.D. (L. *Juris Utriusque Doctor*), Doctor of both Civil and of Canon Law.
 Kans., Kansas.
 K.B., Knight of the Bath; King's Bench.
 K.C., King's Counsel.
 K.C.B., Knight Commander of the Bath.
 K.C.H., Knight Commander of the Guelphs of Hanover.
 K.C.I.E., Knight Commander of the Indian Empire.
 K.C.M.G., Knight Commander of St. Michael and St. George.
 K.C.S., Knight of the Order of Charles III (Spain).
 K.C.S.I., Knight Commander of the Star of India.
 K.C.V.O., Knight Commander of the Victorian Order.
 K.D.G., King's Dragoon Guards.
 K.E., Knight of the Eagle (Prussia).
 K.G., Knight of the Garter.
 K.G.C., Knight of the Grand Cross.
 K.G.C.B., Knight of the Grand Cross of the Bath.
 K.G.C.M.G., Knight of the Grand Cross of St. Michael and St. George.
 K.G.F., Knight of the Golden Fleece (Spain).
 K.G.H., Knight of the Guelphs of Hanover.
 K.H., Knight of Hanover.
 kilog., kilogramme.
 kilom., kilometre.
 K.L.B., Knight of Leopold of Belgium.
 K.L.H., Knight of the Legion of Honour.
 K.M., Knight of Malta.
 K.Mess., King's Messenger.
 K.N.S., Knight of the Royal Northern Star (Sweden).
 K.O.S.B., King's Own Scottish Borderers.
 K.P., Knight of St. Patrick.
 K.R.R., King's Royal Rifles.
 K.S., Knight of the Sword (Sweden).
 K.T., Knight of the Thistle; Knight Templar.
 Kt., Knight.
 Ky., Kentucky, U.S.A.
 L. (L. *libra*), pound (sterling); Latin.
 L.A., Legislative Assembly; Law Agent; Literate in Arts.
 La., Louisiana.
 L.A.H., Licentiate of Apothecaries' Hall (Ireland).
 L.&N.R.R., Louisville and Nashville Railroad.
 L.A.S., Licentiate of the Apothecaries' Society (also L.S.A.).
 Lat., Latitude.
 lb. (L. *libra*), pound.
 L.B.S.C.R., London, Brighton, and South Coast Railway.
 L.C., Lord Chamberlain; Lord Chancellor.
 l.c., lower case (type).
 L.C.O., London County Council.
 L.Ch., Licentiate in Surgery.
 L.C.D.R., London, Chatham, and Dover Railway.

- L.C.P.**, Licentiate of the College of Preceptors.
L.D., Lady Day.
L.D.S., Licentiate of Dental Surgery.
L.F.P.S., Licentiate of the Faculty of Physicians and Surgeons.
L.G., Life Guards.
L.I., Long Island; Light Infantry.
lib. (*L. liber*), book.
Lic.Med., Licentiate in Medicine.
Lieut., Lieutenant.
Lieut. Col., Lieutenant-Colonel.
Lieut. Gen., Lieutenant-General.
Lieut. Gov., Lieutenant-Governor.
Linn., Linnæan.
L.L.A., Lady-literate in Arts.
LL.B. (*L. Legum Baccalaureus*), Bachelor of Laws (the double letter L is used to denote the plural) (also *B.L.*).
LL.D. (*L. Legum Doctor*), Doctor of Laws.
LL.M. (*L. Legum Magister*), Master of Laws.
L.L.I., Lord-Lieutenant of Ireland.
L.M., Long Metre; Licentiate in Midwifery.
L.N.W.R., London and North-Western Railway.
loc. cit. (*L. loco citato*), in the place quoted.
Long., Longitude.
loq. (*L. loquatur*), speaks.
L.O.S., Licentiate of the Obstetrical Society.
L.P., Lord Provost.
L.R.C., Labour Representative Committee.
L.R.C.P., Licentiate of the Royal College of Physicians.
L.R.C.P.E., Licentiate of the Royal College of Physicians (Edinburgh).
L.R.C.S., Licentiate of the Royal College of Surgeons.
L.S., Linnæan Society; (*L. locus sigilli*) the place of the seal.
L.S.A., Licentiate of the Society of Apothecaries (also *L.A.S.*).
L.S.D. (*L. libra, solidi, denarii*), pounds, shillings, pence.
L.S.Sc., Licentiate in Sanitary Science.
L.S.W.R., London and South-Western Railway.
L.T.S.R., London, Tilbury, and Southend Railway.
L.W.M., Low water mark.
LXX (70), Septuagint version.

M., Monsieur.
M.A. (*L. Artium Magister*), Master of Arts (also *A.M.*).
Maj. Gen., Major-General.
M.A.O., Master of the Art of Obstetrics.
Mass., Massachusetts.
M.Ast.S., Member of the Astronomical Society.
M.B. (*L. Medicina Baccalaureus*), Bachelor of Medicine (also *B.M.*).
M.C., Master in Surgery (also *C.M.*); Master of Ceremonies; Member of Congress.
M.C.C., Marylebone Cricket Club.
M.Ch.D., Master of Dental Surgery.
M.Comm., Master of Commerce.
M.C.P., Member of the College of Preceptors.
M.D. (*L. Medicina Doctor*), Doctor of Medicine.
Md., Maryland.
Mdlle., Mademoiselle.
Mdme., Madame.
M.D.R., Metropolitan District Railway.
M.D.S., Master of Dental Surgery.
M.E., Mechanical, Military, or Mining Engineer; Methodist Episcopal; Middle English.
Me., Maine.
Mem., Memorandum.
M.Eng., Master of Engineering.
Messrs., Messieurs, Gentlemen.
M.F.H., Master of Foxhounds.
Mgr., Monsignor.
M.H.A., Member of House of Assembly.
M.Hon., Most Honourable.
M.H.R., Member of House of Representatives.
M.Inst.C.E., Member of the Institution of Civil Engineers.
Mich., Michigan.

M.I.E.E., Member of the Institution of Electrical Engineers.
M.I.Mech.E., Member of the Institution of Mechanical Engineers.
M.Inst.M.E., Member of Institution of Mining Engineers.
Mid., Midshipman.
Minn., Minnesota.
Min. Plen., Minister Plenipotentiary.
Miss., Mississippi.
M.L.A., Member of the Legislative Assembly.
M.L.C., Member of the Legislative Council.
M.M., Their Majesties; Messieurs.
mm., millimetres.
M.Met., Master of Metallurgy.
M.N.S., Member of the Numismatical Society.
Mo., Missouri.
M.O., Money Order (postal).
Mod. (*L. moderato*), moderately (musical).
M.O.H., Medical Officer of Health.
Mont., Montana, U.S.A.
M.O.O., Money Order Office.
Mo.P.Ry., Missouri Pacific System.
M.P., Member of Parliament; Melting Point.
M.P.S., Member of the Pharmaceutical Society; Member of the Philological Society.
Mr. (*L. Magister*), Mister.
M.R., Master of the Rolls; Midland Railway.
M.R.A.S., Member of the Royal Academy of Science; Member of the Royal Asiatic Society.
M.R.C.P., Member of the Royal College of Physicians.
M.R.C.S., Member of the Royal College of Surgeons.
M.R.C.V.S., Member of the Royal College of Veterinary Surgeons.
M.R.G.S., Member of the Royal Geographical Society.
M.R.I., Member of the Royal Institution.
M.R.I.A., Member of the Royal Irish Academy.
M.R.S.L., Member of the Royal Society of Literature.
M.S., Master in Surgery; (*L. memoria sacrum*) sacred to the memory.
M.S.H., Master of Staghounds.
MS., Manuscript; plural, MSS.
M.S.S., Member of the Statistical Society.
Mus.B. (*L. Musica Baccalaureus*), Bachelor of Music (also *B.Mus.*).
Mus.D. (*L. Musica Doctor*), Doctor of Music (also *D.Mus.*).
M.V.O., Member of the Victorian Order.
M.W.G.M., Most Worthy Grand Master.

N.B., New Brunswick; (incorrectly) North Britain, i.e. Scotland; (*L. nota bene*) note well.
N.B.R., North British Railway.
N.C., North Carolina.
N.C.U., National Cyclists' Union.
N.D., no date.
N.Dak., North Dakota.
N.E., New England.
Neb., Nebraska.
nem. con. (*L. nemine contradicente*), no one contradicting.
nem. dis. (*L. nemine dissente*), no one dissenting.
N.E.R., North-Eastern Railway.
net (*It. netto*), lowest; price subject to no deduction whatever.
Nev., Nevada.
N.F., Newfoundland.
N.G., New Granada.
N.H., New Hampshire.
N.J., New Jersey.
N.L., North Latitude.
N.M., N. Mex., New Mexico.
N.O., New Orleans.
No. (*L. numero*), number.
non obst. (*L. non obstante*), notwithstanding.
non pros. (*L. non prosecutus*), he does not prosecute.
non seq. (*L. non sequitur*), it does not follow.
N.P., Notary-public; New Providence.
N.P.Ry., Northern Pacific Railway.

N.R.A., National Rifle Association.
N.S., New Style; Nova Scotia.
N.S.W., New South Wales.
N.T., New Testament.
N.U.T., National Union of Teachers.
N.W.P., North-West Passage.
N.W.T., North-West Territories.
N.Y., New York.
N.Y.C. & H.R.R., New York Central and Hudson River Railroad.
N.Y., N.H. & H.R.R., New York, New Haven, and Hartford Railroad.
N.Z., New Zealand.
N.Z.C., New Zealand Cross.

O., Ohio.
o/a, on account of.
ob. (L. *obit*), died.
O.E., Old English.
O.F., Oddfellows.
O.H.G., Old High German.
O.H.M.S., On His Majesty's Service.
Okla., Oklahoma, U.S.A.
O.M., old measurement; Order of Merit.
O.O.O., stand for the three anthems; *O sapientia, O radix, O Adonai*, sung in the Roman Catholic Church for nine days before Christmas.
O.P., Order of Preachers (Dominicans); out of print; Opposite Prompter.
Op. cit. (L. *opere citato*), in the work referred to.
Ore., Oreg., Oregon.
O.S., old style; out of stock; Ordinary Seaman.
O.S.B., Order of St. Benedict.
O.T., Old Testament.
Oxon. (L. *Oxoniensis*), of Oxford.
Oz., ounces.

P., Princeps (attached to the signature of the Prince of Wales); president.
Pa., Pennsylvania, U.S.A.
Pa.R.R., Pennsylvania Railroad.
P.A.S.I., Professional Associate of the Surveyors' Institution.
P.B. (L. *Philosophia Baccalaureus*), Bachelor of Philosophy (also *Ph.B.*).
P.C., Privy Council. Privy Counsellor; Perpetual Curate; Police Constable.
p.c., post-card; per cent.
P.D. (L. *post diluvium*), after the flood; (L. *Philosophia Doctor*) Doctor of Philosophy (also *Ph.D.*).
P.E., Protestant Episcopal.
P.E.I., Prince Edward Island.
Penn., Pennsylvania.
per an. (L. *per annum*), yearly.
per cent. (L. *per centum*), by the hundred.
P.G.M., Past Grand Master.
Ph.B., see P.B.
Ph.D., see P.D.
pinx. (L. *pinxit*), he (or she) did it. (Put with the artist's name or initials on a painting.)
P.M. (L. *post meridiem*), after noon; Past Master; Postmaster.
P.M.G., Postmaster-General.
P.O., Post Office; postal order.
P.O., Peninsular and Oriental.
P.O.O., Post Office Order.
Pop., population.
P.O.S.B., Post Office Savings Bank.
pp., pages.
P.P., Parish Priest; Parcels Post.
P.P.C. (Fr. *pour prendre congé*), to take leave.
P.P.S., Additional Postscript.
Pr., Prince, Priest.
P.R., Prize Ring.
P.R.A., President of the Royal Academy.
P.R.C. (L. *post Roman conditam*), after the building of Rome.
Preb., Prebend.

P.R.I.B.A., President of the Royal Institute of British Architects.
Prof., Professor.
pro tem. (L. *pro tempore*), for the time being.
prox. (L. *proximo*), in the next month.
P.R.S., President of the Royal Society.
P.R.S.A., President of the Royal Scottish Academy.
P.S. (L. *post scriptum*), postscript; Privy Seal.
Ps., Psalms.
P.T., Pupil Teacher.
P.T.C., Pupil Teachers' Centre.
P.T.O., please turn over.
Pub., Published, Publisher, Publication.
Pub. Doc., Public Documents.
P.W.D., Public Works Department.

Q., query or question.
Q.A.B., Queen Anne's Bounty.
Q.C., Queen's College; Queen's Counsel.
q.d. (L. *quasi dicat*), as if he should say.
q.e. (L. *quod est*), which is.
Q.E.D. (L. *quod erat demonstrandum*), which was to be demonstrated.
Q.E.F. (L. *quod erat faciendum*), which was to be done.
Q.E.I. (L. *quod erat inveniendum*), which was to be found out.
q.l. (L. *quantum libet*), as much as you please.
Q.M., Quartermaster.
Q.M.G., Quartermaster-General.
q.p. (L. *quantum placet*), as much as you please.
qr., quire.
Q.S., Quarter Sessions.
q.s. (L. *quantum sufficit*), enough.
qt., quart.
q.v. (L. *quod vide*), which see.
Q.V.C.S.F., Queen Victoria's Clergy Sustentation Fund.

R. (L. *Rex*), King; (L. *Regina*), Queen.
R., Réaumur (thermometer).
R.A., Royal Academy; Royal Academician; Rear-Admiral; Royal Arch; Royal Artillery.
R.A.M., Royal Academy of Music.
R.A.M.C., Royal Army Medical Corps.
R.A.S., Royal Asiatic Society; Royal Astronomical Society.
R.B., Rifle Brigade.
R.B.A., Royal Society of British Artists.
R.B.R.I., Royal British Radium Institute.
R.C., Roman Catholic.
R.C.P., Royal College of Physicians.
R.C.S., Royal College of Surgeons.
R.D., Rural Dean; Royal Dragoons; Rural District (Postal).
R.D.C., Rural District Council.
R.E., Royal Exchange; Royal Engineers.
Ref. Ch., Reformed Church.
Reg., Registrar; Regent.
Reg. Prof., Regius Professor.
Rep., Report; Representative; Republic.
R. et I., King and Emperor (of India).
Rev., Reverend.
R.F.A., Royal Field Artillery.
R.G.G., Royal Grenadier Guards.
R.G.R., Royal Garrison Regiment.
R.G.S., Royal Geographical Society.
R.H., Royal Highlanders (Black Watch).
R.H.A., Royal Horse Artillery; Royal Hibernian Academy.
R.H.S., Royal Horticultural Society; Royal Humane Society.
R.I., Rhode Island.
R.I.B.A., Royal Institute of British Architects.
R.I.C., Royal Irish Constabulary.
R.I.M., Royal Indian Marine.
R.I.P. (L. *Requiescat in pace*), may he rest in peace.
R.L.O., returned letter office (Postal).
R.M., Royal Mail; Royal Marines.
R.M.A., Royal Marine Artillery; Royal Military Asylum.

- R.M.L.I., Royal Marine Light Infantry.
 R.M.S., Royal Mail Steamer.
 R.N., Royal Navy.
 R.N.R., Royal Naval Reserve.
 R.R.C., Royal Red Cross (for zeal and devotion in nursing sick and wounded soldiers and sailors).
 Rs., Rupees.
 R.S., Royal Society.
 R.S.A., Royal Scottish Academy.
 R.S.E., Royal Society of Edinburgh.
 R.S.M., Royal School of Mines.
 R.S.N.A., Royal Society of Northern Antiquities.
 R.S.O., Railway Sub-office (for letters).
 R.S.S. (*L. Regia Societatis Socius*), Member of the Royal Society.
 R.S.V.P. (*Fr. Répondez s'il vous plaît*), please reply.
 Rt. Hon., Right Honourable.
 Rt. Rev., Right Reverend.
 R.T.S., Religious Tract Society.
 Rt. Wp., Right Worshipful.
 R.U.I., Royal University, Ireland.
 R.V., Revised Version; Rifle Volunteers.
 R.W.D.G.M., Right Worshipful Deputy Grand Master.
 R.W.G.M., Right Worshipful Grand Master.
 R.W.G.R., Right Worthy Grand Representative.
 R.W.G.S., Right Worthy Grand Secretary.
 R.W.G.T., Right Worthy Grand Treasurer; Right Worthy Grand Templar.
 R.W.G.W., Right Worshipful Grand Warden.
 R.W.S., Royal Society of Painters in Water Colours.
 R.W.S.G.W., Right Worshipful Senior Grand Warden.
 R.Y.S., Royal Yacht Squadron.
- S., Saint.
 s., shilling.
 S.A., South Africa; South America; South Australia.
 Salop, Shropshire.
 S.A.M.C., South American Missionary Society.
 S.A.R., Sons of the American Revolution.
 Sarum, Salisbury.
 S.B.A., Society of Biblical Archaeology.
 S.C., South Carolina; (*L. Senatus Consultum*) a decree of the Senate.
 sc. (*L. sculpsit*), he engraved it.
 sc. (*L. scilicet*), that is to say.
 So.B. (*L. Scientia Baccalaureus*), Bachelor of Science (also *B.Sc.*).
 So.D. (*L. Scientia Doctor*), Doctor of Science (also *D.Sc.*).
 scr., scruple.
 S.Dak., South Dakota.
 S.D.F., Social Democratic Federation.
 S.D.U.K., Society for the Diffusion of Useful Knowledge.
 Sec., Secretary.
 Sec. Leg., Secretary of Legation.
 Sen., Senate, Senator.
 seq. (*L. sequentia*), the following.
 S.E.C.R., South-Eastern and Chatham Railway.
 s.f. (*L. sub fine*), towards the end.
 S.F.T.C.D., Senior Fellow of Trinity College, Dublin.
 S.G., Solicitor-General.
 s. in. (*L. sub initio*), towards the beginning.
 S.J., Society of Jesus (Jesuits).
 Skr., Sanskrit.
 S.L., Solicitor at Law.
 S.M., Sergeant-Major.
 Sm. Caps., Small Capitals.
 S.O., Sub-office (Postal).
 Sp., Spain, Spanish.
 sp. (*L. sine prole*), without offspring.
 S.P.C.A., Society for the Prevention of Cruelty to Animals.
 S.P.C.C., Society for the Prevention of Cruelty to Children.
 S.P.C.K., Society for the Promotion of Christian Knowledge.
 S.P.Co., Southern Pacific Company.
 S.P.G., Society for the Propagation of the Gospel.
- S.P.Q.R. (*L. Senatus Populusque Romanus*), the Roman Senate and People.
 sq. (*L. sequens*), the following.
 sq., square—sq. ft., square foot, etc., etc.
 S.R.C., Students' Representative Council.
 S.R.S. (*L. Societatis Regia Socius*), Member of the Royal Society.
 SS., Saints; Steamship.
 S.S., Sunday School.
 S.S.C., Solicitor before the Supreme Courts (Scotland).
 St., Saint.
 S.T.D. (*L. Sacra Theologia Doctor*), Doctor of Theology.
 S.T.P. (*L. Sacra Theologia Professor*), Professor of Theology.
 sub., substitute.
 suff., suffix.
 Supt., Superintendent.
 sup. (*L. supra*), above.
 Sur. Gen., Surgeon-General.
 Surv. Gen., Surveyor-General.
 s.v. (*L. sub voce*), under the word or heading.
 S.W., South Wales; Senior Warden.
 Sw., Sweden, Swedish.
 Swit., Switzerland.
 Syn., Synonym, Synonymous.
- T.C.D., Trinity College, Dublin.
 temp. (*L. tempore*), in the time of (musical).
 Tenn., Tennessee.
 Teut., Teutonic.
 Tex., Texas.
 T.M.O., Telegraph Money Order (Postal).
 T.O., turn over; telegraph-office.
 tonn., tonnage.
 Tr., Translator, Translation.
 tr., transpose (used in correcting printers' proofs); treasurer; trustee.
 T.R.H., Their Royal Highnesses.
 T.T.L., to take leave.
 Typo., Typographer.
- U.C. (*L. urbis condita*), from the building of the city of Rome.
 U.D.C., Urban District Council.
 U.F.C., United Free Church.
 U.K., United Kingdom.
 U.K.A., Ulster King-at-Arms.
 ult. (*L. ultimo*), in the last month.
 Unit., Unitarian.
 Up., Upper.
 U.P., United Presbyterian; under proof.
 U.P.R.R., Union Pacific Railroad.
 U.S., United States; (*L. ut supra*), as above.
 U.S.A., United States of America; United States Army.
 U.S.M., United States Mail.
 U.S.N., United States Navy.
 U.S.S., United States Senate; United States Ship.
 Ut., Utah.
- V., Victoria; (*L. versus*) against; (*L. vide*) see.
 V.A., Vicar-Apostolic; Vice-Admiral; Royal Order of Victoria and Albert.
 Va., Virginia.
 Vat., Vatican.
 V.C., Vice-Chancellor; Victoria Cross.
 V.D., Volunteer Decoration.
 V.D.L., Van Diemen's Land.
 V.D.M. (*L. Verbi Dei Minister*), Minister of the Word of God.
 Ven., Venerable.
 Vet., Veterinary.
 V.G., Vicar-General.
 v.g. (*L. verbi gratia*), for example.
 V.I., Vancouver Island.
 Vis., Viscount.
 viz. (*L. videlicet*), namely.
 vol., volume.

V.P., Vice-President; (*L. vita patrie*) in his father's lifetime.
V.R. (*L. Victoria Regina*), Queen Victoria.
V.S., Veterinary Surgeon.
Vt., Vermont.

W., Wales, Welsh.
Wash., Washington.
W.C.L., White Cross League.
W.C.R., Waterloo and City Railway.
W.C.T.U., Women's Christian Temperance Union.
w.f., wrong fount (used in correcting printers' proofs).
W.I., West Indies.
Wis., Wisconsin, U.S.A.
W. Lon., West Longitude.
W.M., Worshipful Master.
W.O., War Office.
W.S., Writer to the Signet.
W.S.P.U., Women's Social and Political Union.
wt., weight.
W.Va., West Virginia.
Wyo., Wyoming, U.S.A.

X, Christ (the X is the same as the Greek letter Chi, the first letter of Christ's name).
Xmas, Christmas.
Xn., Christian.

Y.M.C.A., Young Men's Christian Association.
Y.W.C.A., Young Women's Christian Association.

Zoo, Zoological Gardens.
Z.S., Zoological Society.

ABBREVIATORS, those who drew up papal writs before they were formally copied out.

ABDAHRAHMAN, Moorish gov. in Spain; defeated by Charles Martel, 732.

ABDALLAH (545-70), f. of Muhammad.

ABDALLATIF (1162-1231), Eastern traveller; MS. of his *Account of Egypt* in Bodleian.

ABDALS, Muslim fanatics in Persia.

ABD-AR-RAHMAN, five Omayyad princes of Cordova: A. I. (756-88), founded Omayyad dynasty in Spain. A. II. (822-52), weak ruler. A. III. (912-81), attained caliphate. A. IV., caliph in 1017; murdered. A. V., caliph, 1023-24; murdered.

ABD-EL-AZIZ IV. (1880-), ex-Sultan of Morocco. See MOROCCO.

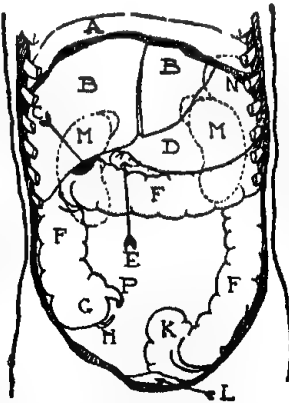
ABD-EL-KADER (1807-83), Amir of Mascara; for fifteen years opposed the conquest of Algeria by France, surrendered 1847, and on release, 1852, became friend of France.

ABDERA.—(1) Oldseaport, S. Spain; Carthaginian trading centre. (2) Ruined town, Thracian coast.

ABDIAS, Gk. form of Obadiah (*q.v.*).

ABDICATION, voluntary surrender of an office of trust; particularly of kings or heads of States. Important a's of later times are—James II., 1688, Napoleon I., 1814 and 1815, Louis Philippe, 1848, Milan of Servia, 1889.

ABDOMEN, the part of the trunk of the human body below the diaphragm (which divides the



ABDOMEN, WITH FRONT ABDOMINAL WALL (INCLUDING THE RIBS) AND THE SMALL INTESTINES REMOVED. A, diaphragm; B, liver; C, gall-bladder; D, stomach; E, pancreas; F, F, F, large intestine; G, caecum; H, appendix; I, rectum; J, bladder; K, M, M, kidneys (behind); L, spleen (behind); P, junction of small with large intestine.

cavity of the trunk into the abdominal cavity and the thoracic cavity); further divided into the a. proper above and the pelvis below, the former containing the stomach, small and large intestine, liver, pancreas, spleen, and kidneys, and the latter the lower part of the large intestine, the urinary bladder, and the internal genital organs. Internally the a. is lined with a serous membrane called the peritoneum, which covers the free surfaces of the abdominal organs and holds the intestine in place by means of a fold called the mesentery, while another fold, the great omentum, covers like an apron the front of the greater part of the abdominal contents. Owing to the modern advances of medicine, and chiefly to the introduction of anaesthetics and antiseptic and aseptic surgery, opening the a. for the relief of disease is an everyday procedure, and one which, with due care, involves very little risk; and, as an aid to diagnosis in obscure cases, opening the a. by incision for the purpose of examining its contents is by no means unusual.

ABDUCTION is the act of any person who unlawfully takes, or causes to be taken, any unmarried girl under the age of sixteen years out of the possession, and against the will, of her parents or guardians; liable to two years' imprisonment, whether the girl consents or not, and whether the person charged believed her to be over the age of sixteen.

ABDUCTOR MUSCLES, those which pull away or aside.

ABD-UL-AZIZ (1830-76), Sultan of Turkey; s. of Mahmud II.; succ. his bro. Abd-ul-Mejid in 1861; assassinated.

ABD-UL-HAMID I. (1725-88), Sultan of Turkey; s. of Ahmed III.; succ. bro., Mustafa III., in 1773.

ABD-UL-HAMID II. (1842-), ex-Sultan of Turkey; succ. to throne (1876) on deposition of his bro. Murad V. His reign opened with a prospect of constitutional reforms which was not fulfilled. He was deposed April 27, 1909, in favour of a younger bro. Reshid Effendi (Muhammad V.).

ABDUL-KADIR (1078-1166), Muhammadan author, revered as saint.

ABDULLAH-EL-TEISHA-ES-SAYYID (1830-99), Sudanese 'Khalifa'; succ. Mahdi, 1885; defeated at Omdurman, 1898; fell in battle.

ABD-UL-MEJID (1823-61), Sultan of Turkey; succ. f. Mahmud II., 1839; concluded peace with Mehmet Ali, 1841; Crimean War undertaken by England and France in his defence.

ABDUR-RAHMAN KHAN, Amir of Afghanistan (1844-1901); noted for political sagacity; improved social conditions of country, and, by grasp of affairs, materially increased its power. His rule consisted of a military despotism, and he succeeded in imposing an organised form of government upon a most unruly people; succ. by c. s., Habibullah.

ABECEDARIAN, a beginner; contemptuous name for an Anabaptist sect; a. psalms, those subdivided under letters of alphabet (*e.g.* clix.).

A BECKETT, ARTHUR WILLIAM (1844-1909), Eng. journalist, author, and war correspondent.

A BECKETT, GILBERT ABBOTT (1811-56), f. of preceding; Eng. comic writer and journalist; author of the *Comic Blackstone*.

A BECKET, THOMAS, incorrect version of Thomas Beckett. See BECKET, THOMAS.

ABEL (Hebrew 'breath'), second s. of Adam; killed by bro. Cain; perhaps originally South Judæan demigod.

ABEL, SIR FREDERICK AUGUSTUS, Bart. (1827-1902), Eng. chemist, famous for researches in explosives; invented new method of manufacturing gun-cotton and cordite (jointly with Prof. J. Dewar); carried out researches with Sir A. Noble on explosion of black powder; invented apparatus for determination of flashpoint of petroleum; chemist to War Department; pres. Institution of Electrical Engineers, 1877; first director of the Imperial Institute, 1887.

ABEL, NIELS HENRIK (1802-28), Nor. mathematician of exceptional ability and promise, known for researches in theory of functions.

ABEL, THOMAS, ABELL (d. 1540), Eng. priest; supporter of Katharine of Aragon; denied royal supremacy and was executed.

ABÉLARD, PIERRE (1079-1142), Fr. scholar and theologian; in early manhood became canon of Notre Dame, Paris, in which city he achieved great success as teacher and lecturer. He was made tutor to Héloïse, niece of Canon Fulbert, and an affection sprang up between them. They were afterwards separated, and an act of violence was committed upon A. at the instance of Fulbert. Subsequently A. became a monk, and Héloïse took the veil. In his later years A. resumed teaching at the Paraclete hermitage, where he was buried, and Héloïse was afterwards laid in the same tomb. The remains of the lovers were, in 1817, removed to Père Lachaise, Paris.

ABELIN, JOHANN PHILIPP (d. c. 1636), Ger. historian.

ABELITES, religious sect, time of St. Augustine; married but continent.

ABELLI (1603-91), Dominican confessor of Catherine de Medici.

ABELMOSK, West Indian evergreen with musky seeds.

ABENCERRAGES, rival faction to the Zegrîs during XV. cent. Moorish rule in Granada.

ABENDANA, two Jewish theologians—(1) JACOB (1630-95), rabbi of Span. Jews in London; (2) ISAAC (c. 1650-1710), taught Hebrew at Cambridge and Oxford.

ABENDBERG (46° 40' N., 7° 50' E.), town, Switzerland.

ABENEZRA, IBN EZRA (1090-1168), Jewish man of letters and Scriptural commentator; b. Toledo; a great traveller.

ABENSBERG (48° 45' N., 11° 50' E.), town, Bavaria; sulphur baths.

ABEOKUTA (7° 8' N., 3° 25' E.), town, Brit. W. Africa, capital of Egba, Southern Nigeria protectorate; trades in rubber, etc. Pop. c. 60,000.

ABERAERON (52° 15' N., 4° 16' W.), seaport, Cardiganshire, Wales.

ABERAVON (51° 36' N., 3° 47' W.), town, Glamorganshire, Wales; municipal borough; engineering, tin, copper, and steel works. Pop. 10,506.

ABERBROTHOCK or **ARBROATH**, see latter.

ABERCARN (51° 40' N., 3° 10' W.), town, Monmouthshire, England. Pop. 16,445.

ABERCORN (9° S., 31° 40' E.), trading station, N.E. Rhodesia.

ABERCORN, JAMES HAMILTON, 1st Earl of (c. 1575-1618), promoted Union of Eng. and Scot. Crowns.

ABERCROMBIE, JAMES, Brit. gen., defeated by Montcalm in Canada, 1758.

ABERCROMBIE, JOHN (1780-1844), Scot. physician and writer upon medical and philosophical subjects.

ABERCROMBY, DAVID (XVII. cent.), Scot. physician and philosopher, author of works well known in his time, some having been translated into French.

ABERCROMBY, PATRICK (1656 to c. 1720), Scot. physician and historian; studied at St. Andrews and Paris; sometime physician to James II.; engaged in controversy with Defoe; author of *Martial Achievements of the Scots Nation* and other works.

ABERCROMBY, SIR RALPH (1734-1801), Brit. General; e. s. of George A. of Tullibody; commander-in-chief in West Indies (1795); fatally wounded at Alexandria (1801); held in universal respect for bravery and uprightness.

ABERDARE (51° 43' N., 3° 28' W.), town, Glamorgan, Wales; principal industry, coal trade; iron trade has decreased since 1875; tinworks, brickworks, breweries. Pop. (1911) 50,844.

ABERDARE, HENRY AUSTIN BRUCE, 1st Baron (1815-95), Eng. statesman; Home Sec., 1889; Pres. of Council, 1873.

ABERDARON, parish, Carnarvonshire, Wales. Pop. 3371.

ABERDEEN (59° 9' N., 2° 6' W.), seaport, royal, parliamentary, and municipal burgh, Scotland. Town built chiefly of grey granite (the 'Granite City'); consists of Old and New A.; Univ. (1494), including Marischal and King's Colleges (united, 1860); R.C. Cathedral, many churches; market cross, original structure dating from 1682, rebuilt 1842; numerous public buildings and hospitals; three parks, four bridges over Dee; chief northern seaport of Scotland; industries include granite-quarrying, deep-sea fisheries, textile paper and jute manufactures, flax-spinning, brewing, distilling, jam manufacture; returns two members. A. obtained charter from William the Lion, 1179, in confirmation of David I.'s grant of corporate rights; burned by Edward III., 1336; rebuilt and enlarged; well fortified; looted by both Royalists and Covenanters; Old Pretender declared king here, 1715. Pop. (1911) 163,084.

W. Robbie, *Aberdeen: its Traditions and History*.

ABERDEEN—(1) (47° N., 123° 57' W.), city, Wash., U.S.A. Pop. (1910) 13,660. (2) (45° 26' N., 98° 50' W.), city, S. Dakota, U.S.A. Pop. (1910) 10,753.

ABERDEEN (32° 30' S., 24° 3' E.), district and town, S. Africa. Pop. 9500 (4800 white).

ABERDEEN, GEORGE GORDON, 1st Earl of (1637-1720), Lord Chancellor of Scotland; s. of Sir John Gordon, of Haddo, Aberdeenshire.

ABERDEEN, GEORGE HAMILTON GORDON, 4th Earl of (1784-1860), statesman; e. s. of George Gordon, Lord Haddo; b. Edinburgh; held offices of Foreign Sec. and Colonial Sec., and in 1852 became Prime Minister; a distinguished scholar, possessed an extensive knowledge of lit. and art; in politics noted for his generosity to opponents.

ABERDEEN, JOHN CAMPBELL GORDON, 7th Earl of (1847-), grandson of 4th Earl; succ. 1870; ed. St. Andrews and Oxford; Lord-Lieut. of Ireland, and P.C., 1886; Gov.-Gen. of Canada, 1893-98; again app. Lord-Lieut. of Ireland, 1905; friend of Gladstone's. His wife, ISABEL MARA (1857-), dau. of Lord Tweedmouth, is an energetic social worker.

ABERDEENSHIRE (57° 18' N., 2° 33' W.), N.E. county, Scotland; area, 1971 sq. miles; has five districts—Mar, Formartine, Buchan, Garioch, Strathbogie; includes several branches of Grampians, among chief peaks being Ben Macdui, Cairntoul, Lochnagar; principal rivers, Dee and Don, noted for salmon; largest lake, Loch Minch. Peterhead, Fraserburgh, Pannanich have chalybeate springs; geological formation, mainly crystalline schists; grouse, partridges, red deer abundant; has ash, fir, larch trees. Agriculture most important industry; oats and barley grown; cattle fattened. Many coast villages engaged in fishing. Other industries include granite quarrying, brickmaking, brewing, distilling. A. sends two representatives to Parliament, besides two for Aberdeen town. Original inhabitants Picts; after Norman Conquest Malcolm Canmore defeated Celts here; temporarily Bruce's headquarters; feuds carried on by great families for many years; was long episcopal stronghold; scene of various engagements between Cavaliers and Covenanters, and of Jacobite risings of 1715 and 1745. Pop. (1911) 311,350.

Watt, *History of Aberdeen and Banff* (1900).

ABERDOUR (56° 8' N., 3° 17' W.), five village, Scotland; excellent bathing. Pop. 2000.

ABERDOVEY (52° 33' N., 4° 4' W.), village, Merionethshire, Wales; health resort.

ABERFELDY (56° 37' N., 3° 52' W.), village, Perthshire, Scotland. Pop. 1592.

ABERFOYLE (56° 20' N., 4° 21' W.), village, Perthshire, Scotland; pop. 1147.

ABERGAVENNY (51° 40' N., 3° W.), town, Monmouthshire, England; was Rom. fort, *Codan-*

nium; often involved in Border struggles, XII.—XIII. cent's; had Benedictine priory. Pop. (1911) 8511.

ABERGELE (53° 20' N., 3° 35' W.), watering-place, Denbighshire, Wales. Pop. 2121.

ABERNETHY (56° 10' N., 3° 18' W.), village and parish, Perth, Scotland; Pictish royal residence.

ABERNETHY, JOHN (1764–1831), Eng. surgeon; assistant-surgeon at St. Bartholomew's Hospital, London, and founder of the medical school; known for his treatment of aneurism.

ABERRANCY (geom.), curve's deviation from its characteristic curvature.

ABERRATION, deviation of mind from the normal; of light, see **LIGHT**.

ABERYSTWTH (52° 25' N., 4° 5' W.), seaport, Cardiganshire; popular seaside resort; educational centre; has Univ. Coll. of Wales. Pop. (1911) 8412.

ABESHER (14° 8' N., 21° 2° E.), capital, Wadai, Fr. Equatorial Africa.

ABEYANCE, a state of suspension; a law term meaning that a freehold, or dignity, is not vested in a person, but is in suspension until the real owner establishes his claim.

ABGAR, title borne by a line of kings whose capital was Edessa (Mesopotamia). A. XIV., it is said, corresponded with Jesus.

ABHIDHAMMA, one of traditional baskets in which the Buddhist Scriptures are divided.

ABIATHAR, a. of Ahimelech; helped king David (1 Sam. 22nd, 23rd; 2 Sam. 15th, 20th); confused with Ahimelech (*Mark* 2nd).

ABICH, WILHELM HERMANN VON (1806–86), Ger. geologist; prof. at Dorpat; retired to Vienna; authority on geol. and min. of Russia; undertook researches on volcanic products.

ABIES, see **FIR**.

ABIGAIL, wife of king David (1 Sam.); in Elizabethan times and later colloquial name for waiting-woman.

ABILENE (32° 25' N., 99° 36' W.), town, Texas, U.S.A.; flour-mills.

ABIMELECH, Philistine king; took Sarah into his harem, Abraham having represented her as his sister, not his wife. She was restored in response to a divine command given in a dream.

ABINGDON (51° 40' N., 1° 15' W.), town, municipal borough, parliamentary division, Berkshire; ruins of Benedictine abbey. Pop. (1911) 6810.

ABINGER, JAMES SCARLETT, 1st Baron (1769–1844), Eng. judge; b. Jamaica; Attorney-General under Canning and Wellington (1827–35).

ABIOGENESIS, spontaneous generation; the origination of living animals and plants from non-living matter, has been more and more discredited by modern biological research and finally disproved by Pasteur's experiments on sterilisation. This, of course, does not bear on the question whether protoplasm may be created from inorganic matter.

ABIPONES, extinct S. Amer. Ind. tribe; inhabited La Plata region.

ABKHASIA (43° N., 41° E.), district, Russ. Caucasus; produces wheat, fruits. Pop. 43,000.

ABLATION (med.), operative removal of a diseased part; (geol.), wearing away, especially of a glacier.

ABLAUT, or 'vowel gradation,' is the modification of the root vowel in same word to mark change of meaning; best illustrated in 'strong' *verbe*, e.g. sing, sang, sung.

ABLEGATE, temporary legate (*q.v.*).

ABLUCTION, an act of cleansing; a religious ceremonial symbolising the purification of the spirit. In the R.C. Church the term refers to the washing of the chalice and the priest's hands after **COMMUNION**.

ABNAKI, tribe of N. Amer. Indians.

ABNER, Old Testament character; defended Ishbaal, Saul's s., against David; killed at Hebron.

ABNEY, SIR WILLIAM DE WIVELESLE (1844–), Eng. astronomer and physicist.

ABNORMAL (law), of persons such as minors,

insane, illegitimate, differentiated by some abnormality. See also **PSYCHOLOGY**.

ABO (60° 28' N., 22° 15' E.), seaport, Finland; chief town, government of A.-Björneberg; Treaty of A. (1734) gave Russia S. Finland. Pop. c. 43,000.

ABO (5° 30' N., 6° 30' E.), town on Niger, W. Africa.

ABOLITIONISTS, those who, before Amer. Civil War, urged immediate abolition, i.e., of slavery (*q.v.*), as opposed to those who favoured legal (and hence slower) procedure.

ABOLLA, a Rom. cloak.

ABOMA, serpents of S. American boa type.

ABOMASUM, the fourth or digesting 'rennet'; stomach of ruminants.

ABOMEY (7° 25' N., 2° E.), capital, Dahomey, W. Africa. Pop. c. 15,000.

ABONDANCE (46° 25' N., 6° 40' E.), town, Haute Savoie, France; cheese. Pop. c. 1500.

ABONY (47° 10' N., 20° E.), market town, Pest, Hungary.

ABORIGINES, legendary people of Latium; name applied to original inhabitants of any country.

ABORS, frontier hill tribe of N.E. India; twice subject of punitive expeditions.

ABORTION, premature expulsion of the human foetus from the uterus or womb; the term is applied in medicine to such an expulsion before the sixth month of intra-uterine life, 'premature labour' being the term applied to later expulsion; popularly 'miscarriage' is the name given to accidental premature expulsion, a. being confined to expulsion induced for medical reasons or performed criminally. With the advance of obstetrical science a. and inducement of premature labour are being abandoned to a great extent as medical procedures. Criminal a., or attempt to procure criminal a., is a felony punishable in Britain by penal servitude or imprisonment.

ABOUKIR (31° 18' N., 30° 5' E.), small town, Egypt; Nelson destroyed Fr. fleet in A. Bay, 1798; Bonaparte defeated Turks, 1799; captured by Sir Ralph Abercromby, 1801.

ABOUT, EDMOND (1823–85), Fr. novelist and journalist; b. Dienne (Lorraine); correspondent of the *Soir* during Franco-Ger. War; member Fr. Academy (1884); fame rests chiefly upon his novels.

ABRA (17° 30' N., 120° 30' E.), mountainous province, Luzon, Philippine Islands.

ABRABANEL—Abarbanel (*q.v.*).

ABRACADABRA, word much used as spell by early necromancers; now term of contempt, rubbish.

ABRAHAM, the patriarch and ancestor of the Jews, according to tradition was originally called Abram. The stories of A. in *Genesis* are found in J, E, and P, the component documents of the Hexateuch, and are not always consistent (e.g. the age of Ishmael). Modern criticism has left it very doubtful to what extent these narratives can claim to be hist.; A. may have been a real person, or a traditional ancestor. It is quite probable that the Israelites as a tribe came from Haran as A. is represented as doing, and before that from Ur in Babylonia, but the detailed historicity of the narrative is quite unproven.

Driver, *Genesis*; Carpenter and Harford Battersby, *The Hexateuch*.

'**ABRAHAM'S BOSOM**,' denotes Paradise; at ancient feasts each guest reclined with his head on his neighbour's breast, hence application of term.

ABRAHAM A SANCTA CLARA (1644–1709), Austrian monk; court preacher in Vienna, 1669; denounced all classes.

ABRAHAM, PLAINS OR HEIGHTS OF (46° 46' N., 71° 10' W.), beside Quebec, above St. Lawrence; where Wolfe defeated Montcalm, 1759; now public park.

ABRAHAMITES, XVIII. cent., Bohemian deists.

ABRAHAM-MEN, lunatics allowed out of restraint to beg; impostors who pretended lunacy.

ABRANTES (39° 29' N., 8° 11' W.), town, Portugal, taken by Junot (later Duc d'A.), 1807. Pop. 6000.

ABRASION (med.), superficial excoaration; (geol.), wearing of rocks by moving ice; (commercial), of coin, loss in weight due to wear and tear of circulation.

ABRAUM SALTS, deposit of potassium, sodium, and magnesium salts above the rock salt of Stassfurt (Prussia).

ABRAXAS, mystical numbers on ancient charms.

ABRIDGMENT, a short, condensed version of a book, case, play, etc.; an epitome.

ABROGATION, act of repealing a law.

ABRUZZI, DUKE OF THE (1873-), Ital. Royal Prince, explorer, and scientist.

ABRUZZI E MOLISE (42° N., 14° E.), mountainous provinces, Italy, including Teramo, Aquila, Chieti, Campobasso; largely pastoral; many inhabitants emigrate. Pop. (1911) 1,428,000.

ABSAŁOM, 3rd and favourite s. of David, k. of Israel; famed for handsome looks; caught by long hair in branches of tree, and killed by Joab.

'ABSAŁOM AND ACHITOPHEL', allegorical satire of Dryden's (1681), in which the Duke of Monmouth, natural s. of Charles II., figures as Absalom, Shaftesbury as Achitophel, and the king as David.

ABSAŁON, AXEL (1128-1201), abp. of Lund (Denmark); chief counsellor of Valdemar I.; founded town, now Copenhagen.

ABSAŁOKAS, Crows, Sioux Indian tribe.

ABSCCESS, a localised collection of necrosed and liquefied material in the tissues of the body, due to bacterial infection and inflammation; wherever possible it should at once be opened and the contents allowed to escape, and then healing will ensue.

ABSCISSA.—When a point is referred to two intersecting axes, one of them called the axis of X and the other the axis of Y, the *abscissa* of the point is the distance cut off from the axis of X by a line drawn through it and parallel to the axis of Y.

ABSENTEEISM, term applied to landed proprietors who derive their income from one country, and spend it in another, in which they live; long prevalent in Ireland.

ABSINTHE, alcoholic liqueur flavoured with wormwood and other herbs; use forbidden in Fr. army and navy, and all traffic in it against Belgian law. See SPIRITS.

ABSOLUTE, condition which is unrestricted, unlimited, or complete; also free from mixture. In logic, that which is independent of reference to something else.

ABSOLUTE TEMPERATURE, see THERMOMETERS.

ABSOLUTE VELOCITY, see VELOCITY.

ABSOLUTION, term used in ecclesiastical law for 'acquittal' from either guilt of sin or penalty of it; generally granted after confession.

ABSOLUTISM, metaphysical doctrine of non-relative existence, possible to be known.

ABSOLVITOR (Scotts law), acquittal of defendant.

ABSORBENTS, substances, such as chalk, which absorb (strictly *neutralise*) acids, or absorb discharges; vessels which absorb and convey fluid within the organism, such as lymphatics. See LYMPHATIC SYSTEM.

ABSORPTION, the transformation of light into another form of energy, such as heat, when passing through a medium. A body which absorbs all the incident radiations is called black, as lamp-black or platinum black. See LIGHT.

ABSTEMII, Calvinistic sect who objected to use of fermented wine in Eucharist.

ABSTINENCE, practice of refraining from various forms of self-indulgence, especially of food and drink. See TEMPERANCE.

ABSTRACT OF TITLE, legal document epitomising a purchaser's rights in real property.

ABSTRACTION, a mental operation in which an idea is stripped of its concrete circumstances so that it may be considered alone.

ABSURDUM, REDUCTIO AD, indirect method of proving a proposition by showing that, were it not

true, the consequence would be absurd; or of disproving a proposition by showing that, if true, the conclusion would be ridiculous.

ABT, FRANZ (1819-85), Ger. composer of song music.

ABTHAIN, ABTHANE (Scotch), abbacy.

ABU, prefix in Arab. proper names, denoting a 'father' or 'owner.'

ABU, MOUNT, peak of Aravalli range in Rajputana, India; health station; fine temples.

ABU HAMMED (19° 28' N., 33° 13' E.), Sudanese town, on Nile.

ABU KLEA (17° 10' N., 33° 20' E.), town, Sudan.

ABU NUWAS, Arab. poet of age of Harun er-Rashid (g.v.).

ABU SIMBEL, Ipsambul, name of group of three rock-hewn temples constructed by Ramesses II. (c. 1250 B.C.) on bank of Nile, in Nubia; principal one discovered by Burckhardt (1812), opened by Belzoni (1817).

ABU 'UBAIDA, distinguished Arab. scholar during rule of Harun er-Rashid.

ABU ZEID, town on White Nile, Egypt.

ABU-BEKR ('Father of the Virgin'), (573-634), 1st Muhammadan Caliph; the name is derived from the marriage of his youthful daughter Ayesha with Muhammad.

ABUL ATA EL MA'ARRI (973-1057), Arab. poet and philosopher; blind from childhood.

ABULFARAJ, called BARHEBRAEUS (b. 1220), bp. of Aleppo; wrote Syrian history of the world and Bible commentary.

ABUL-FARAJ (897-967), Arab. poet and antiquary.

ABUL-FAZEL (1551-1602), historiographer to Akbar, Mogul emperor; assassinated.

ABUL-FEDA (1273-1331), Arab. historian and geographer; fought against Crusaders.

ABULIA, loss of will power; symptom of insanity.

ABU-L-QASIM, ABULCASIS (c. 950 A.D.), Arab. physician, flourished at Cordova; author of once famous works on med. and surgery.

ABULUG (18° 15' N., 121° 20' E.), town, Luzon, Philippine Islands; tobacco, rice.

ABUNDANTIA (classical myth), Latin female personification of abundance.

ABURI (5° 42' N., 0° 15' W.), town, Brit. Protectorate, Gold Coast.

ABUSE, misuse, ill-treat, revile, violate; self-a., masturbation; a. of process, malicious unreasonable legal proceedings of frivolous and vexatious nature, which Court may stop in self-defence.

ABU-THALEB, Muhammad's uncle and protector against the Koreish plots.

ABU-THUBI (24° 32' N., 54° 50' E.), coast town of Oman, Persian Gulf.

ABU-TIG (27° 2' N., 31° 23' E.), town, Nile, Egypt.

ABUTILON, large genus of tropical shrubby plants, order *Mahvaceae*, cultivated in greenhouses as Ind. mallows.

ABUTMENT, in arch., part of arch, pier, etc., which bears pressure.

ABYDOS (40° 7' N., 26° 28' E.), ancient town, Asia Minor; on Hellespont; where Xerxes crossed into Europe by bridge of boats, 480 B.C.; home of Leander, whose story Byron tells in 'Bride of A.'

ABYDOS (26° 10' N., 31° 55' E.), town, Upper Egypt; founded by pre-Menite kings; temples, forts, tombs built from 1st to 30th dynasty, 5500-500 B.C.; declined from Ptolemaic period; ruins of Seti I's Great Temple, tombs, and forts still remain; place sacred to Osiris, whose cult began here in 12th dynasty.

ABYSSAL ANIMALS, carnivorous animals living near bed of deep ocean, with distensible throat and stomach, large gills, and feelers or phosphorescent organs to suit their habitat; many discovered and described by Challenger expedition.

ABYSSINIA (10° N., 40° E.), empire in N.E. Africa; bounded N.E. by Eritrea and Fr. and Brit.

Somaliland, E. and S.E. by Somaliland, S. by Brit. E. Africa, and W. by the Sudan; includes the provinces Tigré, Amhara, Gojam, Shoa, and Harar. It forms part of the great African plateau, and has an average height of some 8000 ft., falling abruptly towards the Red Sea, and more gradually towards the Nile. The whole surface is cut up by deep gorges (sometimes 4000 ft. deep), and in the N.W. the Samen mountains, also steep and bare rock, reach a height of 15,000 ft. The drainage is carried off mostly by the Blue Nile and Atbara, and the former takes its rise in Lake Tana (80 by 20 miles). The lower portions of the country up to 5000 ft. (known as Kolla) have a tropical climate, but the district known as the Woina Dega, from 5000 to 8000 ft., has a warm temperate climate. This is the chief seat of population, and the pastures support large herds of cattle. The higher region, the Dega, has horses and long-woolled sheep. The rainy season is from April to Sept. There are practically no roads, and goods are mostly carried by mules, horses, donkeys, and camels. A railway has been constructed from Jibuti, or Jibuti, in Fr. Somaliland, to Dire Dawa (240 miles) in E. A. The official capital, at Addis Ababa near the centre of the western part of the country, is changed from time to time as the supplies of firewood in the neighbourhood become exhausted.

History.—Ancient Ethiopia embraced part of A., and Sheba is supposed to have been an Abyssinian queen from whose a. by Solomon the kings of A. claim descent. The Axumite dynasty, which ruled from the I. to the X. cent., was strong enough in the VI. cent. to conquer Yemen in Arabia; but in the following cent. the Abyssinians were expelled from Arabia. A. was discovered in the XV. cent. by the Portuguese, who helped them to rout the Muhammadans in 1543. The Royal family, early in the XVII. cent., became Roman Catholics; but in 1633 the king was forced to resign, and his son expelled the alien priests. Fierce and protracted struggles between the chiefs (*ras*) of the various provinces occupied the XVIII. and part of the XIX. cent.; but in 1853 Kassa defeated his father-in-law, Ras Ali, ruler of Amhara and virtual emperor, and proclaimed himself 'king of kings' of Ethiopia as Theodore III. The Brit. Consul and his suite were thrown into prison at Magdala in 1864, and after abortive negotiations to obtain their release Sir R. Napier stormed that fortress in 1868 when Theodore was found to have committed suicide within. Kassai of Tigré now proclaimed himself 'king of kings' and was crowned in 1872 as Johannes II. Italy had established a colony at Assab in 1882, and the Abyssinians looked with suspicion on the extension of the foreign settlement. In 1887 the Abyssinians attacked and almost destroyed a small Ital. force at Dogali. A year later a force of 20,000 men engaged the Abyssinians, but both sides retired. In 1889 Johannes was killed in an engagement with the dervishes, and Menelek of Shoa became emperor. Peace with Italy was kept for some years, but in 1896 Menelek completely overcame a large Ital. force at Adowa, and Italy subsequently recognised the complete independence of A. Gt. Britain, France, and Italy in 1906 undertook to preserve the integrity of A.

The dominant race in A. and the official language are of Semitic origin, but there are also Hamitic Gallas and Somalis, negroes and Jewish Falashas, and a few Europeans. The Abyssinians are deep brown in colour, well-formed and handsome, intelligent and fond of gaiety. They eat and drink heavily. Marriage is easily dissoluble and polygamy common. Abyssinian houses are rough circular stone huts, thatched with grass.

Christianity was introduced in the IV. cent. by Frumentius, and the Abuna or head bp. is still appointed by the Coptic Patriarch of Alexandria, and in ritual, etc., Abyssinian Christianity resembles Coptic. The Abyssinians still remain Monophysites. Since 1907 education has been compulsory upon all male children over twelve. The regular army is drawn from the several provinces, and numbers about 150,000 men. Upon the old feudal government is now grafted some

imitation of European civilisation, a council of ministers having been appointed in 1908.

Abyssinia is rich in minerals, but only a little gold is exported to India. Other exports are ivory, coffee, civet, myrrh and other gums, and wax; the chief imports are cottons (Amer., Brit., and Ind.), woollen fabrics, outlery and hardware, Ital. and Swed. matches. Brit. consul-gen. at Addis Ababa. Area probably about 370,000 sq. miles. Pop. c. 5,000,000. See *Egyrrr*, SOMAILAND.

Wylde, *Modern Abyssinia* (1901).

ACACIA, genus of shrubs and trees of the sub-family *Mimoseæ*, comprising about 450, chiefly Australian and Polynesian species, having compound pinnate leaves or flattened leaf-stalks (*phyllodes*) and clusters of small flowers. Some species produce gum-arabic, catechu, wattle-bark, and valuable timber.

ACADEMY, a gymnasium, near Athens,—named after Academus, presented to the Athenians by Cimon,—where Plato taught for some fifty years up to time of his death (348 B.C.). Its system of teaching was continued by other philosophers, its various periods being known as the 'old,' 'middle,' and 'new' academies.

The name A. is given in modern times to seats of learning, societies devoted to the advancement of lit., the Sciences, art, music, etc.; also to high-class schools, such as the Edinburgh Academy, and to riding, dancing, fencing schools and the like. The most famous of modern A's is the *Académie française*, founded in 1635 by Cardinal Richelieu, the immediate object of which was to set a standard of taste in language and lit., to produce a great national dictionary, and to prepare treatises in poetry and rhetoric. The number of members was fixed at forty. The Fr. A. still remains one of the most flourishing institutions of its kind, and has numbered amongst its members some of the greatest names in Fr. lit. By a system of prizes the Fr. A. encourages lit. and learning in France; and it has exercised no small control over the Fr. language and Fr. style. Together with four other A's it now forms the *Institut de France*. These are the *Académie des Inscriptions et Belles Lettres* (founded by Louis XIV. in 1663); the *Académie des Sciences* (1666); the *Académie des Beaux Arts* (1648); and the *Académie des Sciences Morales et Politiques*. The word 'académie' also applies to each of the 17 Univ. divisions in France.

The foundation of a literary A. in England has often been suggested, but never carried out; in 1902, however, was founded the *Brit. A.* for the Promotion of Historical, Philosophical, and Philological Studies. Other A's are the *Royal A. of Arts* (below), the *Royal Scot. A.*, and the *Royal A. of Music*, founded 1822. The most notable Amer. A's are the *National A. of Design* (New York), the *Amer. A. of Arts and Sciences* (Boston), the *A. of Natural Sciences* (Philadelphia), the *Prabody A. of Sciences* (Salem, Mass.), and many others. In Germany the *Akademie der Wissenschaften* was established in 1700; and most continental countries have one or more A's of kindred type. The International Association of A's was founded in 1899 on the initiative of the Royal Society, and represents a score of European and Amer. A's and learned Societies.

Academy, Royal, Burlington House, London; founded 1768, under the patronage of George III., 'for the purpose of cultivating and improving the arts of painting, sculpture, and architecture.' Sir Joshua Reynolds was the first pres., and there were thirty-six original members, nominated by the King. Each academicians, upon election, presents an approved example of his work, before his diploma can be submitted to the King for signature. Academicians, since 1867, have been elected by members and associates together. The associate class, about thirty in number, was founded in 1769, and from its ranks academicians are chosen. An annual exhibition is held, which is open to all professional artists. The A. schools

provide training in the arts of painting, sculpture, and architecture.

ACADIAN (geol.), middle subdivision of N. Amer. Cambrian, consisting of shales, slates, and limestones.

ACADIE, or **ACADIA**, see NOVA SCOTIA.

ACAJOU, cashew (*q.v.*) or mahogany (*q.v.*) tree.

ACAJUTLA (30° 39' N., 89° 45' W.), seaport town, Salvador, Central America.

ACALEPHE, see SCYPHOMEDUSÆ.

ACALYPHA, genus of Euphorbiaceous plants (*q.v.*).

ACANTHITE, a dimorphous form of argentite (*q.v.*) which crystallises in the ortho-rhombic system.

ACANTHOCEPHALA, class of parasitic 'worms' whose larvæ live in crustaceans or beetles and the adults in vertebrates. They have an anterior retractile proboscis armed with hooks for attachment to the intestinal tissues of the host. They have no alimentary canal, food being absorbed through the skin. *Echinorhynchus proteus* of trout, pike, etc., the habitat of the larvæ being the Amphipod *Gammarus pulex*, and *Gigantorhynchus gigas* of the pig, sometimes in man, the habitat of the larvæ being the cockchafer (*Melolontha*), are typical representatives.

ACANTHOPTERI, or **ACANTHOPTERYGII**, large family of fish with spiny dorsal fin, e.g. perch, mackerel.

ACANTHUS, genus of Mediterranean and Asiatic plants with prickly leaves, which have served as a model for architectural ornamentation, e.g. on Corinthian capitals.

A CAPPELLA, in chapel style, i.e. voices singing without accompaniment or with instruments in unison.

ACAPULCO (16° 50' N., 99° 50' W.), seaport, Mexico; good harbour. Pop. 5000.

ACARINA, **ACARIDA** (zool.), order of Arachnida (*q.v.*), including mites and ticks.

ACARNANIA (38° 45' N., 21° 30' E.), region, ancient Greece; now joined with Ætolia. Pop. c. 150,000.

ACARUS FOLLICULORUM, see ARACHNIDA.

ACASTUS (classical myth.), s. of King Pelias of Iolcus; shared in expedition of Argonauts.

ACATALECTIC, verse complete in all its syllables; antonym, catalectic.

ACATALEPSY, synonymous term for incomprehensibility.

ACAULESCENT (bot.), having no apparent stem, as the dandelion.

ACCA LARENTIA, fabled foster-mother of Romulus and Remus.

ACCELERATION, rate of increase or decrease of the velocity of a body; a. of gravity, the increase in the velocity of a freely falling body, being 980.6 centimetres per second at sea-level in Lat. 45°.

ACCENT (1), stress or emphasis put upon one syllable of a word, e.g. em'phasis. In long words a second subordinate a. may occur. In Eng. language, a. tends towards initial syllables. A. sometimes distinguishes nouns from verbs, e.g. con'vert (noun), convert' (verb). In prosody (*q.v.*), a. plays leading part. (2) Stress on certain notes in music, generally 1st and 3rd notes in bar. (3) Grammatical sign to indicate different kinds of pitch or vowel sound. The acute a. ' marks a stressed syllable, a raised tone, or a 'closed o' in French; the grave a. ' denotes a lowered pitch, or an 'open o' in French; the circumflex a. ' is a compound of the acute and grave, and in Fr. signifies a prolonged vowel. (4) Peculiar pronunciation or intonation, e.g. Glasgow a., French a.

ACCEPTANCE, legal instrument by which a person agrees to the terms of a bill of exchange.

ACCEPTATION of a term is its generally recognised meaning.

ACCEPTILATION, verbal discharge of obligation.

ACCESSION, to succeed to a dignity, or the possession of property.

ACCESSORY, one participating in a crime, either before, or afterwards, but not present at its commission.

ACCIACCATURA, a short 'grace-note,' immediately preceding a principal note in music.

ACCIAJUOLI, **DONATO** (1428-78), Ital. historian and philosopher.

ACCIDENCE, grammatical term relating to inflections of words; rudiments of grammar.

ACCIDENT, unforeseen or unexpected misadventure (see EMPLOYERS' LIABILITY ACTS, and INSURANCE); in logic a fortuitous quality of a thing, not inherent in, or necessarily to be inferred from, a generic term.

ACCIDENTAL, an alteration of the pitch of a note by sharp, flat, or natural; effect limited to bar in which it occurs.

ACCIDENTALISM, theory that events are not the result of direct cause.

ACCIPITER, variety of hawk. See HAWK FAMILY.

ACCIPITRINES (order *Accipitres*), diurnal birds of prey, order of birds containing the day-flying birds of prey, characterised by their great powers of flight, hooked talons and beak, laterally-directed eyes, and carnivorous or carrion-feeding habit. A skoletal point of interest is that the fourth toe is not reversible as in nocturnal birds of prey. The sexes are found in pairs, which mate for life.

ACCIUS (XVI. cent.), Latin poet; paraphrased Æsop.

ACCLIMATIZATION, see CLIMATE.

ACCOLADE, blow on neck or shoulder with flat of sword in ceremony of conferring knighthood; a brace in music.

ACCOLTI, **PIETRO** (1455-1532), Ital. cardinal; drafted Papal Bull against Luther.

ACCOMMODATION, theological term used in several allied senses: (1) the use of a Biblical passage in a sense other than originally intended; (2) symbolic or parabolic language; (3) esoteric 'resurrection' of Christian truth.

ACCOMMODATION BILL, one to which a person puts his name to oblige another without receiving any return for so doing.

ACCORAMBONI, **VITTORIA** (1557-85), Ital. lady, renowned for beauty and tragic fate.

ACCORDION, small free reed, wind instrument with keys; like concertina; invented (1829) by Damian, a Vienna maker.

ACCOUCHEMENT, delivery of a child. See OBSTETRICS.

ACCOUNT, statement, reckoning, reason, etc. Stock Exchange a. is the periodical settlement of transactions between buyers and sellers.

ACCOUNTANT, an expert bookkeeper; one skilled in the preparation of balance-sheets, profit-and-loss accounts, etc.; an indentured apprenticeship of five years is necessary to qualify as a chartered a., during which period the pupil undergoes three examinations. Auditors of accounts are referred to in the Westminster Statutes in Edward I.'s reign.

ACCRA (5° 35' N., 0° 15' W.), seaport, Gold Coast; originated in three forts; exports rubber, ivory. Pop. c. 20,000.

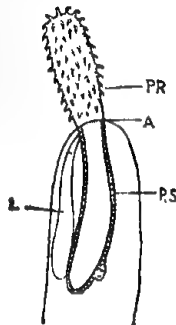
ACCRETION, growth, addition; extension of land by natural process, e.g. silting, retreating watermark, and the like.

ACCRINGTON (53° 45' N., 2° 21' W.), town, Lancashire; cotton works. Pop. (1911) 45,000.

ACCUM, **FRIEDRICH** (1769-1838), Ger. chemist, first promoter of gas-lighting.

ACCUMULATION, in law, the increase of capital by the continuous addition of interest to principal.

ACCUMULATOR, see BATTERY.



Anterior End of an Acanthocephalan. PR, protruded proboscis covered with recurved hooks; A, anterior end of body; PS, proboscis sheath; L, an organ known as lemniscus.

ACE, old Roman unit of coinage (*as*); card with single spot; a very small quantity.

ACELDAMA, *Acts* 1st, field bought by Judas, probably 'field of blood,' possibly 'field of sleep.'

ACENAPHTHENE ($C_{12}H_{10}$), crystalline coal-tar product derived from naphthalene. M.P. 95°; B.P. 278°.

ACEPHALI, sects without a leader, or clergy without benefice or title; fabulous headless beings.

ACEPHALOUS, headless; (zool.), pertaining to the *Acephala* (Lamellibranchiata (*q.v.*)) or bivalve mollusca (*q.v.*); (bot.), having an ovary with a style at the base, instead of at apex.

ACERACEÆ, maple (*q.v.*) family of trees.

ACERENZA (40° 47' N., 15° 58' E.), cathedral town, Italy. Pop. 4500.

ACERNUS, SEBASTIAN FABIAN (1545–1602), Latin form of Polish poet Klonowicz's name.

ACEROSE, needle-shaped, as the leaves of the pine.

ACERRA, Rom. incense box.

ACERRA (40° 55' N., 14° 22' E.), cathedral town, Italy. Pop. 18,443.

ACETABULUM, small Rom. cup for vinegar, etc.; socket in pelvis which receives head of femur or thigh bone.

ACETAMIDINE, see **AMIDINES**.

ACETANILIDE, ANTIFEBRINE, a febrifuge; consisting of shining plates; M.P. 112° C.; prepared by boiling aniline with glacial acetic acid.

ACETIC ACID ($CH_3CO.OH$), colourless pungent liquid, B.P. 118°, obtained by the oxidation of alcohol. It congeals at 16.7° (glacial *a.a.*). Vinegar is impure *a.a.* The salts are termed acetates; potassium and lead acetate are used in medicine. A by-product in the manufacture of *a.a.* from wood spirit is **Acetone**, **DIMETHYL KETONE** ($CH_3CO.CH_3$), a colourless volatile liquid, B.P. 56.5°, used in the manufacture of chloroform, iodoform, sulphonal, and cordite, and as a solvent; occasionally used in medicine for asthma. Another ketone is **Acetophenone**, **PHENYL-METHYL KETONE** ($C_6H_5CO.CH_3$); crystallises in colourless plates; M.P. 20°, B.P. 202°. It is the simplest aliphatic-aromatic ketone.

ACETO-ACETIC ESTER ($CH_3CO.OH.CO.O.C_2H_5$), colourless liquid of pleasant smell, B.P. 181°; of great importance in the preparation of quinolines, pyridines, pyrroles, uric acid, and many other compounds.

ACETYLENE, ETHINE (C_2H_2), colourless, inflammable gas having a faint odour resembling garlic. The pungent smell usually noticeable is due to impurities; liquefies at -82°; solidifies c. -91°. Liquid and solid *a.* are explosive, developing a pressure up to 100,000 lb. per sq. inch, so that their manufacture and use is prohibited in Great Britain. Compressed *a.* and several of its compounds, especially with copper and silver, are explosive. *A.* polymerises under the influence of heat, and an immense number of organic compounds can be built up from it. It can be prepared by the direct union of carbon and hydrogen under the influence of the electric arc, but it is now universally generated by the action of water on calcium carbide (CaC_2). The latter, a crystalline, semi-metallic, frequently iridescent solid, is manufactured by the fusion of a mixture of ground limestone and anthracite in an electric furnace, carbide works being erected in localities where electricity is cheap owing to the presence of water power, e.g. Niagara, Switzerland, Falls of Foyers. Various kinds of *a.* generators have been designed, the main feature being the method by which the water is brought into contact with the carbide. The safest are those in which carbide is dropped into an excess of water, as the dropping of the latter on to carbide creates a great amount of heat, causing the gas to decompose into compounds which choke the burner. As under low pressure and without a small admixture of air the gas burns with a very sooty flame, and a large

amount of air not only produces great heat (utilised in the oxy-acetylene blowpipe), but is highly dangerous, the necessary air for a brilliant flame is obtained from small openings just below the burner tip. It yields 35–45 candle hours per cubic ft. Owing to its many advantages *a.* is being increasingly used for the lighting of vehicles, streets, and buildings.

ACHEÆA, ACHALA (38° N., 22° E.), narrow coast region, Peloponnesus; chief town, Patras; produces currants; *A.* also applied to whole Peloponnesus or Greece.

ACHEANS, fair-complexioned warrior race, who invaded Greece under Pelops, seized territory of dark-haired Pelasgians, and subsequently became the dominant race. **Achaean League**, ancient Gk. confederation of *A.* towns; probably first formed for protection against pirates; became important in IV. cent.; took part in wars against Philip and Antipater; dissolved, 238 B.C.; revived, 280; subsequently became chief power in Greece; warred against Rome; finally crushed by Romans, 146 B.C.

ACHEMENES (Hakhamani), reputed ancestor of ancient Persian royal family (Achemenides).

ACHEUS, nephew of Hellen (*q.v.*), mythical ancestor of Achæans (*q.v.*).

ACHARD, FRANZ CARL (1753–1821), Prussian chemist, applied Marggraf's discovery of sugar in beet to the foundation of beet-sugar industry.

ACHARIUS, ERIK (1757–1819), Swed. botanist and physician.

ACHATES (classical myth.), friend of Æneas; proverbial for fidelity (*fides A.*).

ACHELOUS, river, Greece; rises Mt. Pindus; enters Ionian Sea; modern Aspropotamo.

ACHELOUS (classical myth.), god of river *A.*; c. s. of Oceanus and f. of Sirens.

ACHENE (bot.), term for dry, indehiscent one-seeded fruit with a thin pericarp, e.g. the fruit of the buttercup.

ACHENSEE, or L. ACHEN (47° 30' N., 11° 45' E.), in N. Tyrol, source of Achen River.

ACHERNAR, one of the brightest stars in the S. hemisphere, is a *Eridani*, a straggling constellation, known since V. cent. B.C., which extends from near Orion to the boundaries of Cetus and then down to S. hemisphere.

ACHERON (classical myth.), a river of hell; name of several rivers in Greece suggestive of it.

ACHIEVEMENT, exploit, accomplishment; heraldic hatchment (*q.v.*) or escutcheon.

ACHILL (53° 58' N., 10° W.), island, Irish coast; area, 57 sq. miles; mountainous. Pop. 4929.

ACHILLAS, Egyptian general; one of Pompey's (*q.v.*) murderers.

ACHILLES, legendary Gk. hero; s. of Peleus and Thetis; his quarrel with Agamemnon forms the chief subject of Homer's *Iliad*. *A.* is represented as the typical Gk. hero—handsome, brave, compassionate. After slaying Hector, and other Trojan chiefs, he himself fell by the hand of Paris, receiving an arrow in the heel. As a babe *A.* was dipped by his mother in the Styx and thus rendered invulnerable except in heel by which he was held. *A.'s heel* is used generally to denote one vulnerable spot.

ACHILLES TATIUS (V. cent. A.D.), Gk. rhetorician.

ACHILLES TENDON, prominent tendon of calf muscles inserted in heel bone. See **ACHILLES**.

ACHILLINI, ALESSANDRO (1463–1512), Ital. philosopher.

ACHIMENES, genus of tropical Amer. herbaceous perennials, cultivated in greenhouses for their beautiful flowers which resemble gloxinias.

ACHIN, ATCHIN or ARYER (4° 10' N., 96° 45' E.), district, Sumatra; area, 20,500 sq. miles; principal town, Kota Raja; long remained independent; successfully resisted Portuguese, XVII. cent.; captured by Dutch, 1874; subdued, 1881; again rebelled, 1896; surrendered, 1901; important trading centre from XVII. cent.; exports pepper. Pop. c. 580,000.

ACHITOPHEL, see 'ABSSALOM AND ACHITOPHEL', **ACHITOPHEL**.

ACHLAMYDEAE, see **APETALAE**.

ACHMED, **ACHMET**, see **AHMED**, **AHMET**.

ACHORION, group of fungi. See **OIDIUM**.

ACHRAS, see **SAPOTA**.

ACHERAY (56° 13' N., 4° 25' W.), small loch in Trossachs, Perthshire.

ACHROANTHES, large genus of orchids (g.v.).

ACHROITE, a colourless tourmaline (g.v.).

ACHROMATIC, free from colour (in optics); applied to lens (g.v.); free from accidentals (in music); antonym of chromatic (g.v.).

ACHROMATISM, the property of refracting light without decomposing it into its constituent colours. See **LIGHT**.

ACID, a chemical compound containing hydrogen, which can be replaced by electro-positive elements or radicals (cations), or which, dissociating in aqueous solution, produces hydrogen ions (g.v.). Most a's contain oxygen, but this is by no means a necessary condition, as was formerly held by Lavoisier and others. Davy and Dulong were the first to state that hydrogen was the acidifying principle, and Liebig added final proof by showing that a's containing more than one atom of hydrogen (polybasic a.) can either have the entire hydrogen replaced by a metal (cation) to form normal salts, or only partially to form a. salts, or by different metals to form compound salts. Organic a's are compounds containing one or more monovalent CO.OH groups called carboxyl, forming salts when hydrogen is replaced by a metal, and esters when replaced by alkyl radicals. A characteristic quality of a's is to redden vegetable blues like litmus. **Acidimetry**, measurement of the percentage of acid in a solution. If no other substances are present it may be determined by the specific weight; in other cases the usual methods are either by titration or by determining the quantity of an insoluble salt precipitated, or by calculating the amount of carbon dioxide liberated by the addition of a carbonate. See **BASE**.

ACIDALIUS, **VALENS** (1567-95), Ger. critic and philologist.

ACINETA, ciliated and free-swimming infusorians when young; adults fixed and enclosed in a sheath, provided with suckorial 'tentacles' for feeding on other Protozoa.

ACINIFORM, like grape clusters.

ACINUS (bot.), drupelet or single berry of a multiple fruit, as in the raspberry or bramble, or a grape berry; (anat.), alveolar or sac-like part of certain glands.

ACIPENSER, see **STURGEON**.

ACIREALE (37° 34' N., 15° 8' E.), town, Sicily; thermal springs. Pop. 35,418.

ACIS (classical myth.), Sicilian shepherd, beloved by Galatea; slain by Polyphemus; changed into river A.

ACKERMANN, **KONRAD ERNST** (1712-71), Ger. actor; reformed Ger. stage.

ACKERMANN, **LOUISE VICTORINE**—née Choquet—(1813-90), Fr. poetess.

ACKERMANN, **RUDOLPH** (1764-1834), Ger. publisher of annals and topographical works in London; promoted lithography and engraving.

ACKLIN ISLAND (22° 30' N., 74° W.), one of Crooked Island group, S. Bahamas.

ACKNOWLEDGMENT, an admission, recognition; law term, as a. of debt (g.v.), etc.

ACLAND, **SIR CHARLES THOMAS DYKE** (1842-), 12th Bart., Parliamentary Sec. to Board of Trade and Ecclesiastical Commissioners, 1885.

ACLAND, **LADY HARRIET** (1750-1815), wife of Major A.; displayed great bravery during Amer. War.

ACLAND, **SIR HY. WENTWORTH**, Bart. (1815-1900), Eng. physician; introduced study of natural science in Oxford curriculum.

ACLINIC LINE, line joining places on earth of no magnetic inclination or dip.

ACMITE, **EGGRITE**, NaFe(SiO₃), mineral akin to pyroxene, monoclinic crystals, occurring in igneous rocks.

ACNE, skin disease consisting of inflammation of sebaceous glands, which are plugged by comedones or 'blackheads,' and pimples, which may suppurate; usually affects face, shoulders, and back, and occurs most frequently soon after puberty; believed to be caused by the a. bacillus; indigestion and constipation aggravate the disease. Treatment is general hygiene, and application of sulphur ointment; a vaccine of the a. bacillus has been prepared.

ACCUMETI (Gk. *akometos*, sleepless), order of monks, who, by relieving each other, offered ceaseless divine worship.

ACOLYTE, lowest of four R.C. minor orders; first mentioned in III. cent., but only at Rome; then in Gallican Church. A.'s functions are to light the lamps, carry the candlesticks or thurible, and assist the priest to wash his hands; a. functions now generally carried out by laymen. See **ORDERS**.

ACOMINATUS, **MICHAEL**, **AKOMINATOS** (c. 1140-1220), Byzantine ecclesiastic and writer; b. Chonæ (Colossæ). Nicetas (Niketas), younger bro., a politician.

ACONCAGUA.—(1) (32° 38' S., 70° W.) Volcanic peak in S. Andes, highest mountain in American continent (23,080 ft.); (2) a province of Chili; chief town, San Felipe; area, 5485 sq. miles. Pop. 129,000.

ACONITE (*Aconitum*), genus of plants of the buttercup family, with tall stems and blue or yellow flowers, including about 60 species, e.g. *A. napellus*, common monkshood, wolfsbane (*A. lycoctonum*), cultivated in gardens. The roots are poisonous, containing aconitine (C₃₄H₄₇O₁₁N) and other alkaloids, used in med. externally as a chloroform liniment to relieve neuralgic pains, and internally in small doses to steady and slow the action of the heart in fever.

ACORN, nut of oak (g.v.).

ACORN SHELLS, see **ENTOMOSTRACOA**.

ACORUS CALAMUS, the sweet-flag, rush-like plant of the order *Araceae* (g.v.), allied to cuckoo-pint (*Arum*), with a tapering spike of closely packed flowers; found in wet situations in temperate regions. The roots have been used medicinally and for flavouring.

ACOSTA, **JOSÉ DE** (c. 1539-1600), Span. author and Jesuit missionary; b. Medina del Campo.

ACOSTA, **URIEL**, **GABRIEL** (fl. 1635), Portug. Jew; ed. in R.C. faith, which he renounced.

ACOTYLEDONES, term for flowerless plants, now replaced by cryptogams (g.v.).

ACOUSTICS, the science of sound (g.v.). The acoustic (hearing) qualities of a hall are increased by rough surfaces (draperies, audience), as an empty room confuses the sound owing to echoes (g.v.).

ACOYAPA (11° 55' N., 85° 0' W.), town, Chontales, Nicaragua.

ACQUAPENDENTE (42° 40' N., 11° 40' E.), small town, Italy; bp.'s see.

ACQUAVIVA (40° 53' N., 16° 49' E.), town, Bari, S. Italy.

ACQUAVIVA, **CLAUDIO**, see **AQUAVIVA**.

ACQUI (44° 41' N., 8° 29' E.), cathedral town, Piedmont, Italy; sulphur springs. Pop. 13,786.

ACQUIESCENCE, compliance, without opposition, but not necessarily with approval.

ACQUITTAI, setting free, absolving in a judicial verdict (g.v.).

ACQUITTANCE, discharge from debt or like liability.

ACRASIA, Circe-like enchantress, representing Intemperance, in Spenser's *Faerie Queene*.

ACRASPEDA, see **SCYPHOMEDUSAE**.

ACRE, land measure, originally area ploughed by a yoke of oxen in a day; now legally equal to 160 sq. rods (4840 sq. yds. = 4047 sq. metres). See **MEASURES**.

ACRE (32° 55' N., 35° 5' E.), town, Palestine;

renamed *Ptolemais* by Ptolemy I. (g.v.); taken by Crusaders and retaken by Saracens in first and third crusades; seized by Turks, 1617; unsuccessfully besieged by Napoleon, 1799; captured by Ibrahim Pasha, 1831; taken by Austrian, Brit. and Turk. allies, 1840. Pop. c. 11,000.

ACRÉ, AQUARY (11° S., 68° 20' W.), river, Brazil; joins Purús.

ACRI (39° 28' N., 16° 23' E.), town, S. Italy.

ACRIDINE (C₁₂H₈N₂), colourless, crystalline, basic compound occurring with anthracene in coal-tar. The solutions of its salts are fluorescent.

ACRISIUS (Gk. myth.), king of Argos, f. of Danaë; killed accidentally by grandson Perseus.

ACRO, HELENIUS (fl. II. cent. A.D.), Rom. commentator and grammarian.

ACROGERAUNIAN ('Thunder-struck') MOUNTAINS (40° 15' N., 20° E.), Albania; highest peak, 6300 ft.

ACROGENÆ (bot.), erroneous and obsolete term for higher cryptogams, such as ferns, mosses, and liverworts, with apical growth of stem.

ACROGRAPHY, stereotyping from designs traced on chalk surface.

ACROLEIN (OH.CH.CO.H), colourless, strongly refracting liquid, B.P. 52.4°, with pungent irritating vapours, distillation product of glycerine and fats, smell of smouldering candle wick due to a.

ACROLITHS, ancient statues, the trunk being of wood, the rest of marble or other stone.

ACROLOGY, the study of alphabetic symbols and initial sounds and syllables; cf. Acrophony (g.v.).

ACROMEGALY, chronic disease characterised by enlargement of head, chest, hands, and feet, associated with disease or derangement of pituitary gland (g.v.), extracts of which are used in treatment of A.

ACROMION, process of shoulder-blade to which collar-bone is attached.

ACROPHONY, representation of a sound in ancient times by a picture or symbol which in still earlier times was used to signify an object of which that sound is the initial syllable or letter.

ACROPOLIS, fortified height above Gk. city; within walls were temples and public buildings. See **ATHENS**.

ACROPOLITA, GEORGE, AKROPOLITES (1217-82), Byzantine historian, diplomatist; wrote *Annales*.

ACROSE, kind of sugar (g.v.).

ACROSTIC, verse composition in which the initials of the lines form a word, or phrase; used by the Greeks and Latins, and later by Boocaccio. In a double a. the final letters also form words.

ACROTHERIUM, in arch., angle of pediment, also ornament placed thereon.

ACT, a deed performed; division of a play; in law, a written instrument completing a transaction; also, *act of God*, an unforeseen unpreventable occurrence; *act of grace*, granting of a privilege.

ACT OF CONGRESS, statutes of U.S.A. Legislation, except for revenue, may be initiated in either House (Executive have seats in neither). Bills are first considered by appropriate Standing Committee. In House of Representatives these number 48, are appointed by Speaker, controlled by party in power, and discuss and arrange bills, their action being rarely challenged by House. Senate legislates more as a whole. Bills may be amended by other house; but, after passing both, become law by President's assent, or without it, if not returned within 10 days, or if after his veto each house passes them anew with two-thirds majority.

ACT OF PARLIAMENT, name given to decrees of legislative body. A's of P. are divided into chapters (*capitula*). Procedure is as follows:—

A. **PUBLIC BILLS**.—Member moves for leave to introduce bill, and, leave being granted, brings it to table. Clerk of House reads out title; motion (never opposed) that bill be read first time and printed; first reading followed by order of House for second reading

on appointed day. In second reading there are three stages: general debate (time for proposals to shelve or amend), reading in Committee, report of Committee. Bill may be returned to Committee, added to or amended. Motion for third reading is not usually opposed; after reading, Clerk ordered to carry bill to Lords and desire their concurrence, endorsing it '*sic baille aux seigneurs*'. Read in Lords first time; notice for second reading given within twelve days or bill dropped for session; if much amended sent back endorsed '*a cette balle avecques des amendemens les seigneurs sont assentus*'; Commons may accept or reject amendments; failure to agree leads to appeal to country (procedure before *Parliament Act*, 1911; see **PARLIAMENT**). After passing both Houses and receiving Assent (g.v.) of sovereign bill becomes Act. Few bills are now introduced by private members.

B. **MONEY BILLS**.—These must originate in Commons, and cannot be amended or rejected by Lords.

C. Procedure in case of **PRIVATE BILLS** differs, and is largely judicial in character.

ACTA DIURNA, ancient daily news-letter, instituted by Julius Cæsar.

ACTA SANCTORUM, lives of saints in 62 folio vols., begun in XVII. cent. by the Jesuit, Roswyde (d. 1629), and carried on by Bollandists (g.v.).

ACTA SENATUS, proceedings of Rom. Senate; first pub. by Julius Cæsar.

ACTÆON (classical myth.), hunter who surprised Diana whilst bathing, and was changed into stag.

ACTINAL, belonging to mouth end of radiate animal; *abactinal*, pertaining to opposite end.

ACTING, see **THEATRE**.

ACTINIA, genus of sea-anemones (g.v.).

ACTINIC RAYS, rays in the blue, violet, and ultra-violet part of the spectrum which are strongly chemically active.

ACTINISM, property of solar rays by which chemical changes are effected, e.g. in photography.—**Actinology**, science dealing with this property.

ACTINIUM, a radioactive element, discovered by Debierne. See **RADIOACTIVITY**.

ACTINOLITE, a grey-green kind of amphibole (g.v.).

ACTINOMETER, instrument for measuring the chemical and heating effects of light.

ACTINOMYCOSIS (**STREPTOTRICHOMYCOSIS**), chronic infectious disease of cattle and of man caused by the *streptothrix actinomyces* and allied organisms. The region of the mouth and jaw is the commonest site of a.; in animals there are tumour-like masses of granulation tissue; and in man there is usually swelling and chronic suppuration; it may spread to the lungs, brain, and other internal organs. Treatment is to remove affected tissues by operation; X-rays and potassium iodide are used where this is impossible.

ACTINOPODA, sub-class of **HOLOTHURIANS** (g.v.).

ACTINOZOA, term originally used for all radially symmetric animals, then restricted to a group of coelentera (g.v.) synonymous with **Anthozoa** (g.v.).

ACTION, term referring to a civil proceeding taken in a law court for the adjudication of rights.

ACTIUM (38° 56' N., 20° 40' E.), promontory and village, ancient Greece; Octavian defeated Mark Antony, 31 B.C.

ACTON (51° 31' N., 0° 6' W.), suburb of London. Pop. (1911) 57,523.

ACTON, CHARLES JANUARIUS EDWARD (1803-47), ed. Cambridge; cardinal, 1842.

ACTON, JOHN EMERICH, 1ST BARON (1834-1902), Eng. historian; nephew of above; a zealous R.C.; opposed doctrine of Papal Infallibility in 1870, but did not secede from Catholic Church; raised to peerage (1889); app. prof. of Modern History at Cambridge (1895); literary output small, but work all marked by deep scholarship.

ACTON, SIR JOHN F. E., Bart. (1736-1811), politician; s. of an Eng. physician at Besançon; grand-uncle of above; became Prime Minister to Ferdinand IV., king of Naples.

ACTS OF THE APOSTLES, a unique book in the New Testament giving the history of the Church from the Ascension of Christ till the imprisonment of St. Paul in Rome. The A. is traditionally the work of St. Luke, being the continuation of his Gospel. External evidence for this is strong, and there is no contrary tradition. Much controversy has arisen over the so-called 'we' passages. Many critics have thought that these might be by St. Luke and were incorporated with the A. by the author (whoever he was). Recent investigation by Harnack and others makes it probable that all the book is by St. Luke. As regards the 'we' passages, the change from 3rd to 1st person may be due either to incorporation of his own diary or to vivid recollection of personal experience. The earlier part is concerned with the work of the Apostles as a whole, the later with St. Paul. It is probable that the historicity of the work is greater in the later part than in the earlier, for which the author may have been dependent on oral tradition. The speeches, like those of other ancient authors, can hardly claim to be the actual words spoken. There is also an important textual problem: possibly the author himself issued a second edition. The date must be before the end of the 1. cent., Harnack now thinks before 70 A.D. Recent investigation tends on the whole to support its historicity.

Harnack, *Luke the Physician, Acts of the Apostles, Date of the Gospels and Acts*; commentaries in *Expositor's Greek Testament*, etc.

ACTUARY, originally registrar or clerk; now official calculator to insurance company. Actuarial work has now become a science, and the a. can, when furnished with the proper statistics with regard to any person, assess with sufficient accuracy the chances of his living a given time. The material for such a decision is provided by statistics of the general population, which are now reduced mathematically. The security of Insurance work, hence, depends upon as large a selection as possible of the general population being included among its clients. The a. errs, however, on the side of security.

ACULEATA, bees, wasps, ants, and other Hymenoptera (q.v.) with stings.

ACUMINATE (bot.), tapering to a sharp point, e.g. leaves.

ACUÑA, CHRISTOVAL DE (1597-1676), Span. explorer and Jesuit missionary.

ACUNHA, D', see **CUNHA, DA**.

ACUPRESSURE, stopping bleeding by closing the blood vessel with a needle.

ACUPUNCTURE, pricking an affected part of the body with a needle as a remedy for disease.

ADA (45° 50' N., 20° 9' E.), town, on Theiss, Hungary. Pop. 12,000.

ADABAZAR (40° 43' N., 30° 25' E.), town, Asia Minor; textile industries. Pop. 18,000.

ADAGIO, musical term indicating slow time; also slow movement in a composition.

ADALBERON (fl. 975), abp. of Rheims; Chancellor of Lothaire and Louis XV.; consecrated Hugh Capet.

ADALBERT, ADALBERT (c. 1000-1072), abp. of Hamburg-Bremen; said to have refused papal chair; made legate by Leo. IX.; extended Christianity in North.

ADALBERT, ST. (c. 950-987), bp. of Prague; later missionary in N. Germany and Poland; martyred in Prussia.

ADALIA (36° 53' N., 30° 46' E.), port, Asia Minor, at head of gulf of A.; founded by Attalus II. (*Attalia*); **SATALIA** of Crusaders; exports grain, cattle, and horses; coast trade. Pop. 25,000.

ADAM, the first man according to *Genesis*. The derivation of the name is obscure, probably from a root also found in Assyrian 'to make, produce,' possibly from another 'to be red,' but A. means in Hebrew also 'man, mankind' in general. The more primitive account of the creation of man is in chap. ii. 4b-8: that in i.-ii. 4a (the Priestly Code) is later.

Some think that originally the narrative was merely mythological and has been 'toned down' by the editor. The creation of man in 'the image of God' and some later traditions seem to show that the position of A. was exalted. Several Babylonian legends offer some, but none a very complete parallel to the story of A.; according to one, a hero Etana is cast down from heaven, which suggests the Fall. There are not many references to A. in the other books of the Old Testament, and the conception of original sin as resulting from the Fall is hardly found. Various legends about him are found in later Jewish lit., and works exist bearing his name in Ethiopic and Armenian. Driver, *Genesis*; Tennant, *Sources of the Doctrine of the Fall and of Original Sin*.

ADAM OF BREMEN, XI. cent., geographer and historian; earliest references to Vinland (q.v.) found in his works.

ADAM DE LA HALLE, ADAM (d. c. 1288), Fr. trouvère; the 'Hunchback of Arras' (*le Bossu d'Arras*); wrote *Jeu de Robin et Marion* (oldest known comic opera).

ADAM, ADOLPHE (1803-56), Fr. composer of comic operas; best, *Le Postillon de Longjumeau*.

ADAM, ALEXANDER (1741-1809), Scot. scholar and antiquary; 40 years rector of Edinburgh High School; Scott and Jeffrey among pupils; pub. *Roman Antiquities* (1791); *Latin Dictionary* (1806).

ADAM, SIR FREDERICK (1781-1853), Brit. General; served in Egypt, Mediterranean, and Catalonia; his brigade with the Guards repulsed the Old Guard at Waterloo; Lord High Commissioner, Malta and Ionian Islands; gov. of Madras, 1832-37; general, 1840.

ADAM, JEAN (1710-85), Scot. poetess; school-mistress and hawker; religious verses; *There's nae Luck about the House* ascribed to her with little probability.

ADAM, JOHN (1779-1825), acting Gov.-Gen. of India, 1823.

ADAM, JULIETTE, née LAMBER (1836-), Fr. novelist and miscellaneous writer.

ADAM, LAMBERT SIGISBERT (1700-50), Fr. sculptor of distinction; member of Academy.

ADAM, PAUL (1862-), Fr. novelist; wrote novel sequence on Napoleonic campaigns.

ADAM, ROBERT (1728-92), Scot. architect; b. Kirkcaldy; app. architect to King and Board of Works, 1762; designed the Adelphi buildings; Admiralty gateway; Register House, St. George's Church, and Univ. buildings, Edinburgh; Glasgow Infirmary, and many private houses; buried in Westminster Abbey.

ADAM SCOTUS, XII. cent. mystic and theologian; abbot of Candida Casa (sometimes called Whithorn).

ADAM, WILLIAM, of BLAIR ADAM (1751-1839), Brit. politician and lawyer.

ADAMANT, figurative term applied to something extremely hard; a diamond, loadstone, or emery stone.

ADAMASTOR, phantom haunting Cape of Storms (now Cape of Good Hope); appears in Camoens' *Lusiads*.

ADAMAWA (8° N., 13° E.), country, W. Africa; conquered by Adams Fula emir, early XIX. cent.; under Brit. and Ger. control since 1900.

ADAMITES, sect who copied Adam in going without clothes.

ADAMNAN, ST. (625-704), Irish abbot of Iona; wrote life of St. Columba and the first work on the Holy Places.

ADAMS (42° 38' N., 73° 8' W.), town, Massachusetts; cotton factories. Pop. (1910) 13,026.

ADAMS, CHARLES FRANCIS (1807-86), Amer. diplomatist; s. of John Quincy A. (q.v.); sometime ambassador to Great Britain; sat on tribunal of Arbitration at Geneva which settled the Alabama claims.

ADAMS, CHARLES KENDALL (1835-1902), Amer. educationist and historian; pres. of Univ. of Wisconsin.

ADAMS, HENRY CARTER (1852-), Amer. statistician and economist.

ADAMS, HERBERT (1858-), Amer. sculptor; vice-pres., National Academy of Design, New York.

ADAMS, HERBERT BAXTER (1850-1901), Amer. educationist and historian; prof. of Amer. History, Johns Hopkins Univ., Baltimore.

ADAMS, JOHN (1735-1828), second Pres. of U.S.A.; s. of a farmer; grad. Harvard Univ.; obtained large practice as barrister in Boston; sat in Philadelphia Congress, 1774; chairman of Board of War, 1776-77; Commissioner to the Court of France, 1778; Ambassador to Gt. Britain, 1785; Vice-Pres. of the Union, 1789; succ. Washington as Pres., 1795.

ADAMS, JOHN COUCH (1810-02), Eng. astronomer; b. Cornwall; ed. Cambridge, where eventually became prof. of Astronomy and director of Observatory; chiefly remembered for share in discovery of the planet Neptune (1846), whose existence became known about same time to Fr. astronomer, Leverrier.

ADAMS, JOHN QUINCY (1767-1848), sixth Pres. of U.S.A.; c. s. of Pres. John A.; barrister, 1791; app. Minister to Netherlands, 1794; Berlin, 1797; elected to Massachusetts Senate, 1802; member of U.S. Senate, 1803; Minister to Russia, 1809; Great Britain, 1815; Sec. of State, 1817; Pres. 1825-29; Wrote series of papers controverting Paine's doctrines in the *Rights of Man*.

ADAMS, SAMUEL (1722-1803), Amer. statesman; b. Boston; took active part in municipal politics; was member of Caucus (Caulker's) Club, with which the word 'Caucus' is said to have originated; Lieut.-Gov. State of Massachusetts, 1789; Gov., 1794.

ADAMS, THOMAS (d. c. 1655), Eng. scholar and divine.

ADAMS, WILLIAM (d. 1620), Eng. navigator; held captive many years in Japan; made voyages to Siam and Cochin-China (1616-18).

ADAM'S APPLE, popular name for projection of thyroid cartilage of larynx on front of the neck; tradition says that when Adam tried to swallow the apple it stuck in his throat, hence swelling in necks of adult men.

ADAM'S BRIDGE (9° 4' N., 79° 30' E.), sandbank chain, off Ceylon.

ADAM'S PEAK (6° 51' N., 80° 27' E.), mountain, Ceylon (7420 ft.); a foot-like depression on top is ascribed by Muhammadans to Adam, who is said to have stood here on one foot doing penance until forgiven by God.

ADAMSON, PATRICK (1637-92), abp. of St. Andrews; pub. numerous Latin works; accused of heresy and deprived of revenue of his see; in later years supported by charity.

ADAMSON, ROBERT (1852-1902), Scot. philosopher; ed. Edinburgh and Heidelberg; app. to chair of Logic, Owens Coll., Manchester, 1876; went to Aberdeen, 1893; held chair of Logic at Glasgow from 1895; wrote volumes on Kant and Fichte.

ADANA (37° 40' N., 36° 10' E.), province, Asia Minor; fruit, cereals; chief town, ADANA (37° 1' N., 36° 18' E.). Pop. c. 50,000.

ADANSON, MICHEL (1727-1806), Fr. naturalist; spent five years in Africa collecting specimens; compiled grammars and dictionaries of Senegal languages.

ADAPTATION, in a literary sense, to prepare a play from a published novel, or to derive a novel from a play; in evolution, the process by which organisms are adjusted to their environment (q.v.).

ADDA (45° 10' N., 9° 49' E.), river, Italy; joins Po.

ADDAH (5° 46' N., 0° 42' E.), town, on Volta, Gold Coast, Brit. W. Africa.

ADDAMS, JANE (1860-), Amer. sociologist; founder of Hull House, Chicago.

ADDAX, genus of light-coloured antelopes (q.v.) with twisted horns, living in N. African, Arabian, and Syrian deserts.

ADDER, the common viper (*Vipera berus*); the African puff-a. (*Bitis arietans*); the death-a. (*Acanthopis antarcticus*) of the Moluccas; name also applied to several non-poisonous snakes of N. America.

ADDISON, JOSEPH (1672-1719), Eng. essayist and poet; b. Milston (Wilts); ed. Charterhouse and Oxford; some of his early verses and translations brought him to the notice of Jacob Tonson, who introduced him to men of rank and fashion. He sought the patronage of King William, and was awarded a pension of £300, upon the strength of which he travelled in France and Italy, and later accompanied Prince Eugene, as Sec. Upon the King's death A. lost his pension and found himself without employment. He now spent some time in Germany, where he wrote his classical play *Cato*, and *Dialogues on Medea*. Later, on the recommendation of Lord Halifax, he was commissioned to celebrate the victory of Blenheim in verse, which resulted in *The Campaign* (1704), and A. received a commissionership of Appeal in Exchequer. In 1706 he was made Under-Sec. of State, and produced his opera, *Rosamond*, in same year. A comedy from his pen, *The Drummer*, was produced at Drury Lane in 1710, but without success. A's chief passport to fame consists in the charming essays, satirising men and manners, which he contributed to *The Spectator*; in this branch of lit. he stands unrivalled; *Life*, by Courthope (1884).

ADDISON'S DISEASE, usually affects middle-aged males, and is characterised by progressive loss of strength, pigmentation of the skin in patches, and gastro-intestinal disturbances. The disease resembles tuberculosis of the suprarenal capsules (q.v.). It is treated with suprarenal extract, rest, tonics, etc., but it invariably ends fatally, sometimes after a prolonged course of several years.

ADDED PARLIAMENT, summoned April, dissolved June 1614 by James I. to whom it refused supplies.

ADDO BUSH (33° 40' S., 26° E.), stunted forest, Cape Province Coast.

ADDRESS, THE, reply of Houses of Parliament to the Sovereign's speech at opening of new session.

ADDUCTOR, muscle that pulls limb towards middle line of body; or in bivalves (q.v.) pulls shells together.

ADELAAR, CORT SIVERSEN (1622-75), Norse seaman; ennobled for distinguished service as Dan. Admiral; fought with Venetians against Turks.

ADELAIDE (34° 50' S., 138° 35' E.), capital, S. Australia; founded, 1837; named after Queen A.; Univ., Government House, two cathedrals, parks, viceregal summer residence; woollen goods, hardware, soap. Pop. (1911), with suburbs, c. 192,000.

ADELAIDE, town and district, Cape Province, S. Africa. Pop. (district) a. 10,000 (2300 white).

ADELAIDE (d. 999), queen of Italy; m. (1) Lothair, a. of Hugh, king of Italy; (2) Otto I. of Germany, who, in her right, laid claim to the kingdom of Italy. A. wielded important influence in Germany, and was crowned in Rome (962) by Pope John XII.

ADELAIDE, QUEEN (1792-1849), consort of William IV.; charitable and virtuous, she greatly purified Eng. Court.

ADELARD OF BATH (XII. cent.), Eng. savant; travelled seven years in France, Spain, Italy, Africa, and Asia Minor, acquiring wide knowledge of various schools of philosophy; translated Euclid's Elements.

ADELER, MAX (1841-), Amer. humorist; pseudonym of Charles Heber Clark.

ADELSBERG (45° 46' N., 14° 20' E.), town, Carniola, Austria; stalactite caves and subterranean river. Pop. 3600.

ADELUNG, JOHANN CHRISTOPH (1732-1806), Ger. philologist and grammarian; pub. dictionary, grammars, and works on style.

ADEMPITION, legal term, meaning to revoke a gift.

ADEN (12° 50' N., 45° E.), seaport on Gulf of A.,

and Brit. territory forming rocky peninsula, Arabia; town fortified; important coaling station; a free port; trading centre; captured by Romans, c. 24 A.D., by Turks, 1538; Brit. since 1839; subject to Bombay Government. Pop. 46,165.

ADEN, GULF OF (12° 30' N., 48° E.), between Somaliland and Arabia.

ADENINE ($C_5H_5N_5$), crystalline organic compound obtained as a decomposition product of nucleins, and from glandular organs. It has also been prepared synthetically.

ADENOIDS, soft velvety masses, due to overgrowth of the lymphoid tissue, projecting down from the back of the nose and throat; the child affected has usually a stupid, open-mouthed expression, and may be the subject of asthma, deafness, or may micturate involuntarily during the night; nutrition is interfered with, and the child is often backward and languid. Treatment is removal of the a. by a slight surgical operation, and respiratory exercises afterwards.

ADEPHAGA (i.e. voracious), predatory Coleoptera (q.v.), such as tiger beetles.

ADERNO (37° 37' N., 14° 51' E.), town, Sicily. Pop. 25,850.

ADEMAR DE MONTEIL (d. 1098), crusader, bp. of Puy en Velay, who accompanied Raymond, Count of Toulouse, and d. of plague at Antioch.

ADHERBAL (d. 113 A.D.), king of Numidia; murdered at cousin Jugurtha's order.

ADHERENCE, adhesion (q.v.) in figurative but not physical sense.

ADHESION, the state of adhering or sticking to anything; used generally as meaning an attachment to a party or policy, or technically in physics, mechanics, botany, pathology, in regard to the union of parts or surfaces.

ADIABATIC, applied in thermodynamics to such processes as are carried out without any gain or loss of heat to a body.

ADIANTUM, **MAIDENHAIR**, large genus of graceful ferns, native of tropical America.

ADIAPHORON (indifferent), point not defined by Church, or subject to injunction of moral law.

ADIGE (45° 6' N., 11° 40' E.), river, Italy; enters Adriatic.

ADIGERAT, **ADIGHERAT** or **ADIGNAT** (14° 10' N., 39° 30' E.), town, Tigre, Abyssinia; sandstone.

ADIPOCERE, waxy, brownish substance into which the tissues of dead bodies are sometimes converted under certain conditions, usually after long immersion in water or burial in moist earth; it consists mainly of fatty acids.

ADIRONDACKS (44° 10' N., 74° 20' W.), mountains, New York, U.S.A.; many isolated peaks; highest, Mount Marcy (5344 ft.); district well wooded; lakes, streams; health resort; produces magnetic iron ore, graphite, etc.

ADIS ABABA, **ADIS ABEBA** (9° 1' N., 38° 56' E.), capital, Abyssinia; founded, 1892. Pop. c. 35,000.

ADJUDICATION, act of pronouncing judgment; in Eng. bankruptcy law the process by which a person is made, or 'adjudged,' bankrupt.

ADJUNCT, word or words which modify others (gram.); a non-essential or subordinate attribute (metaphysic) or person (general).

ADJUTANT, military term for officer who assists commander of a corps or regiment, and has charge of correspondence, drill, and discipline.—**Adjutant-General**, departmental head on army general staff, in charge of discipline, efficiency of troops, etc.

ADJUTANT (*Leptoptilus argala*), large East Indian stork with a bare pouch on the breast, living on carrion and snakes, and, therefore, protected by law in India. See STORKS.

ADLER, FELIX (1851–), Amer. educationist; prof. of Political and Social Ethics, Columbia Univ.; author of *Creed and Deed, Life and Destiny, Religion of Duty*, etc.

ADLER, NATHAN MARCUS (1803–90), chief rabbi of Brit. Empire; suoc. by s., HERMAN ADLER (1839–1911).

ADLERGREUTZ, KARL JOHAN (1757–1815), Swed. general; promoter of Revolution of 1809 which dethroned Gustavus IV.

ADLERHOF, village, near Potsdam, Prussia.

ADLINGTON (53° 38' N., 2° 38' W.), parish, N. Lancashire; cotton-spinning. Pop. 4500.

ADMETUS (classical myth.), king of Thessaly; one of Argonauts; served by Apollo as shepherd; m. Alceste (q.v.).

ADMINISTRATION, term referring to management of a deceased person's estate; act of administrator.

ADMINISTRATION or **EXECUTIVE**, Board entrusted with government of country. Crown freely chose its ministers until close of XVIII. cent.; since then they have been selected by sovereign from predominant party in Parliament by advice of Premier (q.v.). Majority are members of Lower House; if principal Sec. of State sits in Lords, under-sec. of his department is usually member of Commons and replies to questions concerning his department; less than half are members of Cabinet (q.v.). Chief departments of a. are Treasury, Home Office, Board of Trade, Colonial Office, India Office, Foreign Office, War Office, Admiralty, Local Government Office; lesser departments are Board of Agriculture and Fisheries, Board of Education, Board of Works, and Revenue Department (includes Customs, Inland Revenue, and Post Office). In U.S.A., A. comprises President and Cabinet app. by him (subject to Senate's confirmation). Ministers' powers are direct over their depts., but purely consultative as a Cabinet.

ADMIRABLE CRICHTON, see CRICHTON.

ADMIRAL, name, of Arab. origin, and now applied to highest officers in the navy, thus: Admiral, Vice-A., Rear-A., and A. of the Fleet, which latter carries the highest distinction; in XVI. and XVII. cent's the name (sometimes spelt 'Ammiral') was used for the ship carrying the chief naval officer; in XVI. cent. France the title was borne by A. de Coligny, who was a military commander; grades of A. in Red, White and Blue squadrons abolished in Brit. navy in 1864.

ADMIRALTY, THE, is the administrative body, under the direction of the Government, whose business is the maintenance of the Brit. navy and all that relates thereto. In the infancy of the navy its affairs were conducted by a council under the direction of the sovereign; then from the early part of the XV. cent. until well into the XVII. cent. it was controlled by successive lords high admirals. Naval administration, as it is now understood, owes its inception to Henry VIII, who added two separate councils, known as the Admiralty Board and the Navy Board, which had charge of different departments relating to naval affairs. The office of Lord High Admiral was subsequently abolished, and the various Boards and departments joined under one administration.

The present organisation dates from the early part of the XIX. cent. It consists primarily of six naval commissioners, the 'First Lord' holding Cabinet rank. The supreme administration is in the hands of the First Naval Lord, and he is assisted by Second, Third, and Junior Naval Lords, a Civil Lord, and Parliamentary Sec. Thus, while the First Lord supervises generally all naval business, and advises upon matters relating to maritime defence; the Second Lord is charged with all that concerns the manning and personnel of the Fleet; the Third Lord with the management and control of dockyards and kindred affairs; the Junior Lord with naval hospitals, coaling, victualling, etc.; the Civil Lord with naval buildings and works; and the Parliamentary Sec. who has charge of accounts and all naval expenditure. There is also a Permanent Sec. who conducts correspondence and has the care of naval documents. By the creation (January 1912) of a new 'War Staff' certain additions have been made to the naval ad-

visory body. The staff is divided into three divisions: (1) War Intelligence; (2) Operations (plans); and (3) Mobilisation (war arrangements). The War Staff discharges no administrative duties, and its functions are entirely of an advisory character, but it is hoped that by providing accurate information the work of the First Naval Lord will be greatly assisted. Moreover the arduous work of the Third and the Junior Naval Lords has been lightened by the creation of an additional permanent Civil Lord, who has taken over the business of supplying stores, ammunition, etc., hitherto conducted by the two Lords named.

ADMIRALTY COURT, for the trial of maritime causes is believed to have existed in some form, so far back as Edward I.'s reign. It certainly existed as a civil court, with officers and functionaries, in Edward III.'s days. The original purpose in the institution of the court was to deal generally with cases of piracy, crimes at sea, and the distribution of prize-money. During times of war there was a special Prize Court (abolished in 1865). The functions of the High Court of A. are now exercised by the Probate, Divorce, and A. Division of the High Court of Justice, which has jurisdiction over cases of damage to cargo, salvage, bottomry (mortgage of ship) and wages; crimes committed on board Brit. ships; acts of piracy; also prizes taken in time of war.

ADMIRALTY GULF (13° S., 126° E.), large inlet, Kimberley division, W. Australia.

ADMIRALTY ISLAND (57° 30' N., 134° 30' W.), off Alaskan coast; belongs U.S.A.

ADMIRALTY ISLANDS (2° S., 147° E.), islands, New Guinea; largest, Manus; Ger. protectorate.

ADMONITIONISTS, upholders of a Puritan manifesto, 1572.

ADOBE, clay used for unburnt, sun-dried bricks in Spain, America.

ADOLESCENCE, period between childhood and maturity; in males from about fourteen to twenty-four years of age; in females, twelve to twenty-one, during which time character is formed and physical development takes place.

ADOLPH OF NASSAU (d. 1298), Ger. king; subsidised by Edward I. of England to attack France, but left compact unfulfilled; deposed and killed in battle.

ADOLPHUS FREDERICK (1710-71), king of Sweden; s. of Christian Augustus, Duke of Schleswig-Holstein-Gottorp.

ADOLPHUS, JOHN LEYCESTER (1795-1862), Eng. judge; wrote *Letters to Reginald Heber* (1821); *Letters from Spain* (1858).

ADONAI ('Lord'), Jewish substitute for sacred name of Jehovah (q.v.).

ADONAI'S, Shelley's poetic name for Keats (q.v.).

ADONI (15° 38' N., 77° 12' E.), town, India. Pop. 30,416.

ADONIJAH, 4th s. of King David; slain by Solomon.

ADONIS (classical myth.), youth of marvellous beauty, beloved by Aphrodite (Venus). He was killed by a boar whilst hunting, but such was Aphrodite's grief that he was permitted to leave the under-world for a portion of each year. From his blood sprang the **ADONIS**, a genus of European and Asiatic ranunculaceous plants with yellow or red flowers; known as pheasant's eye in England.

ADOPTION, act of taking a person into relationship which he or she does not naturally occupy; especially s. of children as sons or daughters; s. was common amongst Greeks and Romans and was subject to strict and well-defined laws.

ADOPTIONISTS, heretics who in VIII. cent. maintained that Christ was the Son of God, not by birth, but by adoption, and as being one with Him in character and will.

ADORF (50° 20' N., 12° 15' E.), town, Saxony. Pop. 5000.

ADORNO, plebeian family to which belonged several Doges of Genoa, XIV.-XVI. cent's.

ADOUR (43° 32' N., 1° 32' W.), river, France; flows through Hautes-Pyrénées, Gers, Landes, to Bay of Biscay.

ADOWA, **ADUA** (14° 20' N., 38° 50' E.), town, Abyssinia; trading centre; Italians defeated, 1896. Pop. c. 3000.

ADRA (36° 45' N., 2° 59' W.), port, Spain. Pop. 11,188.

ADRAR (20° 30' N., 12° W.), various oases and hilly districts, Sahara.

ADRASTUS (classical myth.), s. of Talaus, king of Argos; leader in war of 'Seven against Thebes.'

ADRIA (45° 3' N., 12° 18' E.), town, Italy; in olden times a flourishing seaport; now 14 miles inland owing to silting of river Po; gave name to Adriatic (q.v.). Pop. 15,678.

ADRIAN (41° 57' N., 84° 3' W.), town, Michigan; wire-fence factories. Pop. (1910) 10,763.

ADRIAN, or **HADRIAN** (q.v.), Roman emperor.

ADRIAN, name of six popes; the first three of Roman birth; A. IV., Nicholas Breakspear (q.v.) (1154-69), only Englishman ever elected Pope.

ADRIAN, SAINT (d. c. 300 A.D.), whilst serving as Prætorian guard under Emperor Galerius Maximian was converted to Christianity and suffered martyrdom for his faith; patron of soldiers; festival, Sept. 8.

ADRIANOPLE (41° 20' N., 27° E.), vilayet, Turkey; area, 15,000 sq. miles; mountainous; silk industry. Pop. c. 1,000,000.

ADRIANOPLE (41° 40' N., 26° 37' E.), capital, A. Turkey; fortress; commercial centre; silk and textile manufactures; exports opium, scent, fruits; fine mosque, palace, bazaar; took name from Emperor Hadrian, who embellished it; Ottoman capital till fall of Constantinople, 1453; besieged by Russians (1878); taken by Balkan Allies, March 26, 1913, after siege of 155 days. Pop. c. 80,000.

ADRIATIC SEA (43° N., 15° E.), arm of Mediterranean (c. 450 miles long) between Italy and shores of Austria-Hungary, Montenegro, Albania; little tidal motion; for Queen of A., see **VENICE**.

ADULLAM (c. 31° 36' N., 35° 1' E.), town, Canaan; twice refuge of David.

ADULLAMITES, the 'oave' or group of Liberals who seceded in 1866 on Franchise Bill; so named by John Bright (see *I Samuel* 22).

ADULTERATION OF FOOD.—Under the Sale of Food and Drugs Act (1875), and its amending Acts (1879 and 1899), it is an offence to knowingly adulterate any article of food, intended for sale, with any ingredient or material that would render it injurious to health, or in the case of a drug, that would affect its quality or potency. It is likewise an offence to sell to the prejudice of the purchaser any article of food or any drug which is not of the nature, substance, and quality of the article demanded.

The s. of foods is by no means a merely modern offence. There are references in ancient Latin writers to the admixture of white clay with flour; and in England, as far back as the XII. cent., public proclamations were made regarding the s. of bread. Yet the practice continued, and not only were bakers the offenders, but vintners, pepperers, and other tradesmen. Then, at a later date, after the introduction into England of tea, coffee, and cocoa, these articles were adulterated with foreign ingredients on a very large scale. As late as the early years of the XIX. cent. it was customary to adulterate beer with molasses, vitriol, and numerous other substances.

In the early fifties of the XIX. cent. Dr. Hassall was commissioned by the *Lancet* to undertake investigations into the composition of food-stuffs, and the results were found to be so alarming that a commission was appointed to inquire into the subject further. The recommendations of this commission resulted in the passing of the Adulteration of Food and Drugs Act (1900), which, however, was found non-operative,

and it became necessary to pass an additional Act which prescribed a penalty of £50 for a., with imprisonment with hard labour for a second offence. By the existing Sale of Food and Drugs Act (1899) the use of sugar and chemical preservatives is allowed (provided they are not injurious). To produce the greenness in tinned peas sulphate of copper is now generally used. For a long period butter was largely adulterated with foreign fatty matter, but by the passing of the Margarine Act (1887) it was made compulsory that every package of this substance be branded on top, bottom, and sides with the word 'Margarine' in capital letters at least three quarters of an inch square. If exposed for sale by retail it must bear a label with letters at least an inch and a half square. Foreign wines for the Eng. market were at one time largely adulterated, with the result that the trade languished and the growers suffered considerable loss thereby. It may be noted that whisky was formerly manufactured entirely by means of pot-still distillation, but since the introduction of the patent-still it has been found that a stronger spirit can be produced; and the admixture of malt whisky with crude spirit has produced a liquor which the public finds more palatable than pure malt whisky. Since 1879 it has been illegal to offer brandy, whisky, or rum for sale at a greater reduction than twenty-five degrees below proof, or gin below thirty-five degrees. A. sometimes takes place without the knowledge of the manufacturer. Thus in the summer of 1900 upwards of 5000 persons (beer-drinkers) were found to be suffering from arsenical poisoning, and a number of deaths occurred. This was found to have arisen from the use of a glucose preparation in which the ingredients supplied to the brewers were of an inferior quality and contained a large percentage arsenic.

In U.S.A. food is inspected in most States. There are laws defining purity in certain foods, and by the *Pure Food Act*, 1906, penalties are imposed upon any who convey from State to State, or to foreign countries, foods, liquors, confectionery, drugs, etc., which are adulterated or misbranded (as judged by specific definitions).

ADULTERY, illicit sexual intercourse of married person with another than his or her spouse; the Eng. law is that wife's a. constitutes ground for divorce (*q.v.*), but in the husband's case it must be shown to have been bigamous or incestuous, or be otherwise complicated by cruelty, or two years' desertion. In Scotland a. is ground for divorce, irrespective of sex.

AD VALOREM (Lat. 'according to value'), duty levied by custom authorities on goods at their estimated value; opposed to specific duty which is according to the weight or size of goods.

ADVENT, solemn season of preparation for the Christmas festival, which has been observed by the Western Churches since VI. cent.

ADVENTISTS, SECOND, Amer. religious sects, followers of William Miller (1781-1849), who look to near future for the Second Coming of Christ. The millennium was expected in 1843. An offshoot, the 'seventh-day adventists,' fix no particular time for the Second Coming, observe Saturday as the Sabbath, and abstain from alcohol, tobacco, pork, tea, and coffee.

ADVENTURER, a mercenary soldier; an impostor or rogue. A merchant a. was a merchantman who boldly sought fortune in foreign parts in XVI. and XVII. cent's.

ADVERTISEMENT, the wholesale manner of obtaining publicity by means of notices in periodicals and newspapers, and by posters on public boardings, is of comparatively recent date, but it has grown to such dimensions that colleges have been established for the purpose of training people as a. writers, and many well-known artists' works now figure as illustrated posters. Yet the custom of advertising in news-sheets dates back to the Cromwellian period. According to a writer in the *Edinburgh Review*, Feb.

1843, the first a. appeared in the *Mercurius Politicus*, Jan. 1652, but later research has shown that similar notices appeared in London newspapers during the years 1647 and 1648. These early a's referred chiefly to books or nostrums. An Act of 1712 imposed a duty on all newspaper a's, which was reduced in 1838 from 3s. 6d. to 1s. 6d. in Gt. Britain, and from 2s. 6d. to 1s. in Ireland. The tax, in 1851, is said to have produced over £175,000. The duty was abolished in 1853. France, Italy, Belgium, some of the Swiss cantons and certain States of America still impose a tax by means of licence charges on billposters and agencies.

Grant, *Newspaper Press* (1871) and articles in *Quarterly Review*, June 1855, and *Edinburgh Review*, Feb. 1843.

ADVOCATE, one who pleads a cause, particularly in a court of law; as a legal term the name is now only used in France, Scandinavia, and Scotland, the Scot. a. being equivalent to the Eng. barrister.—**Advocate**, Lord, Chief Counsel for the Crown and public prosecutor in Scotland and a member of the administration in power.—**Advocates**, Faculty of, collective term for the advocates practising at the Scot. bar; it is necessary to pass two examinations before admission to the body can be obtained, one in general scholarship and one in law; the first is dispensed with if applicant has taken the M.A. degree in a Brit. Univ.; fees about £330, devoted chiefly to the upkeep of the *Advocates' Library*, Edinburgh (founded, 1682), belonging to the Faculty of Advocates; over 500,000 books; entitled to a copy of every book pub. in United Kingdom.

ADVOCATUS DIABOLI, 'devil's advocate,' official (formerly called *promotor fidei*, promoter of faith) app. by R.C. Church to state objections to any proposed act of canonisation, as opposed to the supporter, *advocatus Dei*; hence the modern colloquial use of the phrase for one who trumps up a case, or brings forward an untruthful accusation against another.

ADVOWSON, the right of presentation to an Eng. ecclesiastical benefice vested in the holder and heirs for ever; a's are either *presentative* or *collative*. In the former the patron presents his nominee to the bp. with the request that he be instituted to the vacant living; in the latter case the bp. is himself the patron. Before the passing of the Benefices Act (1898) there existed *donative* a's in gift of sovereign or other patron, without reference to bp.; these are now merged in the *presentative*.

ADYE, SIR JOHN MILLAR (1819-1900), Eng. general; served in Crimea and throughout Ind. Mutiny; wrote *Defence of Cawnpore*, *Review of Crimean War*, *Frontier Campaign in Afghanistan*, and other books.

ADYTUM, sanctuary in ancient temples to which only priests were admitted; most famous in temple of Delphic Apollo.

Æ, a letter invented by the Anglo-Saxons to represent the sounds of *a* in Mod. E. *hat* and *care*. It disappeared after the Norman Conquest, and its sounds are now represented by *a* or *e* (cf. *Alfred* for O.E. *Ælfred*, *there* for O.E. *thær*). In such words as *cæthelic* to-day, *æ* stands for the Greek *ai*, which is commonly represented in modern English by *e* (cf. *osthetic* for *æsthetic*).

ÆACUS (classical myth.), king of Ægina, s. of Zeus and Ægina; famed for justice; app. one of 3 judges of Hades.

ÆCLANUM (c. 41° 2' N., 15° E.), ancient Samnite town, Italy; ruins remain.

ÆDILES, EDILES, Rom. magistrates having charge of buildings, baths, aqueducts, food supplies, and public games.

ÆETES (classical myth.), king of Colchis, f. of Medea (*q.v.*).

ÆGADIAN ISLANDS (38° N., 12° 16' E.), off Sicily; largest, Favignana. Pop. c. 7000.

ÆGEAN SEA (38° N., 25° E.), portion of Mediterranean, archipelago between Greece, Asia Minor, and Turkey. Islands include Samos, Chios, Cyclades, Cos, Lesbos. See **ÆGEUS**.

ÆGEUS (classical myth.), king of Athens, s. of Pandion and f. of Theseus; when Theseus returned from Crete after death of Minotaur, he forgot to hoist white sails as signal of his success, and A., at sight of black sails, concluding his s. was dead, threw himself into sea, which has since been called the *Ægean*.

ÆGINA (37° 45' N., 23° 30' E.), island, Greece; ruins of old temple to Aphæa. A. was originally subject to Epidaurus; inhabited by Dorians from c. IX. cent. B.C.; became commercial state; introduced valuable coinage system; apparently joined Ætريان league; warred against Samos, VII. cent. B.C.; war with Athens broke out, 488, lasted till 481; Athenians worsted. After first Peloponnesian war, A. surrendered and became subject to Athens, c. 456 B.C.; Æginetans expelled, 431 B.C., when Athens founded cleruchy in A.; old inhabitants restored by Lysander at end of war; island was Spartan base of operations in Corinthian war; henceforward historically unimportant; dominated successively by Macedonians, Ætolians, Attalus of Pergamum and Rome; subsequently became Venetian colony; plundered by Barbarossa, 1537; ceded to Turks, 1718; town was capital of Greece, 1826-28. A. has sponge fisheries; chief town, Ægina. Pop. 4300.

ÆGINA (Zool.), see *HYDROMEDUSÆ*.

ÆGIR (Norse myth.), a sea giant.

ÆGIS (literally a goat skin), the shield of Zeus (Jupiter) made of the skin of the goat Amalthea; also applied to the breastplate or protection of Athene bearing the Gorgon's head; hence 'under the a.' is used figuratively for protection.

ÆGIETHUS (classical myth.), king of Argos; lived in adultery with Clytemnestra. Both were slain by Orestes (q.v.), s. of Agamemnon, whom they murdered.

ÆGIUM (38° 30' N., 22° 5' E.), coast town, Achæa, ancient Greece.

ÆGLE (classical myth.), one of Hesperides (q.v.).

ÆGOSPOTAMI (c. 40° 30' N., 26° to 27° E.), river, Asia Minor; flows into Hellespont.

ÆGROTAT (Lat. 'he is ill'), term used at Universities to denote that a student is absent through illness.

ÆGYPTUS, s. of Belus; king of Arabia.

ÆHRENTHAL, COUNT ALOIS VON (1854-1912), Austro-Hungarian statesman; engaged in Diplomatic Service, 1877-1906; Foreign Minister, 1906-12; effected annexation of Bosnia and Herzegovina, 1908.

ÆKEN, HIERONYMUS VAN—known as Bosch—(c. 1460-1518), Flemish painter, sculptor, and engraver.

ÆLFGAR (fl. 1050), Earl of Mercia; s. of Leofric and Lady Godiva.

ÆLFRED ÆTHLING (d. 1036), younger s. of Æthelred and Emma; claimed Eng. throne, but defeated and blinded by Earl Godwin.

ÆLFRED THE GREAT, see **ALFRED**.

ÆLFRIC (fl. 1000), early Eng. author; abbot of Eynsham, near Oxford; wrote *Homilies*, *Grammar* and *Glossary*, and *Lives of Saints*; called *The Grammarian*.

ÆLIA CAPITOLINA (31° 47' N., 35° 15' E.), town built on site of Jerusalem by Hadrian.

ÆLIAN (II. cent. A.D.), Gk. writer on military subjects; wrote treatise on drill and tactics, often translated.

ÆLIANUS, CLAUDIUS (fl. 200 A.D.), Rom. rhetorician; wrote on natural history, etc.; valuable quotations from prior writers.

ÆLLA (d. 588), king of Deira.

ÆLTRE (51° 56' N., 3° 48' E.), village, E. Flanders, Belgium.

ÆMILIA VIA, ÆMILIAN WAY (44° 30' N., 8° 52' E.), high road constructed by Romans, 187 B.C., from Rimini to Piacenza.

ÆNEAS (classical myth.), s. of Anchises and Aphrodite; m. Creusa, dau. of Priam, king of Troy. When Troy was in flames he carried away his f. and his household gods upon his shoulders, leading his s. Ascanius by the hand. His exploits, wanderings, and adventures are narrated in Vergil's *Æneid*. He is the legendary forefather of Romulus and Remus and the Julian gens in Rome, and is proverbial for his filial devotion (*pious Æneas*).

ÆNEAS SILVIUS, see **PIUS II.** and **PICCOLOMINI**.

ÆNEAS TACTICUS (IV. cent. B.C.), Gk. writer on military subjects, particularly fortifications.

ÆNESIDEMUS (I. cent. B.C.), Gk. sceptic philosopher; wrote *Pyrrhonian Principles*.

ÆENG (19° 40' N., 93° 53' E.), river and frontier town, Lower Burma.

ÆOLIAN HARP, musical instrument, consisting of strings of gut or silk stretched on box of thin deal or pine, on which the wind is allowed to play; name derived from Æolus (q.v.).

ÆOLIAN ISLANDS, Lipari Islands (q.v.).

ÆOLIANS, branch of Gk. race founded by Æolus (q.v.); originated in Thessaly, whence spread N. and S. and emigrated into Asia Minor.

ÆOLIS (39° N., 27° E.), Gk. colony, Asia Minor.

ÆOLOTROPIC, property of a body by which it reacts unequally to heat, light, electricity, and elasticity in different directions.

ÆOLUS (classical myth.), god of winds who dwelt in Æolian isle where he kept winds confined in caves; (2) king of Thessaly, s. of Hellen (q.v.); legendary ancestor of ÆOLIANS.

ÆON, infinite length of time; hence the tautological phrase, 'endless moons of time.' Among Gnostics (q.v.) one of a succession of powers conceived as emanating from God and presiding over successive creations and transformations of being.

ÆPINUS, FRANZ ULRICH THEODOR (1724-1802), Ger. natural philosopher; spent many years as prof. in St. Petersburg; made researches in electricity and magnetism, and wrote treatises on mechanics, optics, and astronomy.

ÆPYORNIS, gigantic fossil bird of Madagascar; eggs over a foot long.

ÆQUI, ancient Ital. people, N.E. Latium, subdued after long struggles by Romans, 302 B.C.

ÆRARIJ, inferior class of Rom. citizens, who had no vote, could not serve in army, nor fill office of magistrate.

ÆRARIUM, Rom. public treasury where accounts and moneys were kept, also brass tablets of the laws, and public documents.

ÆERATED BREAD, bread made without yeast; charged with carbonic acid gas; claims to be more nutritive and digestible than ordinary bread.

ÆERATED WATERS are charged with carbon dioxide at high pressure, occurring naturally in springs together with salts in solution, and frequently of medicinal value. They may be artificially prepared either through the effervescence produced by sodium bicarbonate and tartaric acid, with various flavourings, or by forcing compressed carbon dioxide from a steel cylinder into water, which is sold in bottles or syphons. See **MINERAL WATERS**.

W. Kirkby, *Evolution of Artificial Mineral Waters* (Manchester, 1902).

ÆERATION, process of charging with air, e.g. venous blood and plants. In plants the leaf is the organ by which a. is carried on, oxygen being taken in and carbonic acid gas expired in breathing, while in daylight there is another process of a., carbon being extracted from the carbonic acid in the atmosphere and oxygen being exhaled.

ÆERIAL, or antenna, or air wire, the elevated conductor or detector in wireless telegraphy (q.v.).

ÆEROBES, see **BACTERIOLOGY**.

ÆERODROME, course for aviation. See **FLIGHT**.

ÆERODYNAMICS, science of air in motion.

ÆEROLITES, see **METEORITE**.

AERONAUT, a balloonist; the word **AIRMAN** has been suggested for the aeroplaneist.

AEROPHORE, a vessel carried by firemen and divers which renews expired air.

AEROPLANE, see **FLIGHT**.

AEROSCOPE, instrument through which air is drawn to extract dust, bacteria, etc., suspended in it.

AEROSTATICS, science of equilibrium under air pressure.

AEROTHERAPEUTICS, the treatment of disease by air or other gases. Pure air, under ordinary conditions, is of the greatest value in the treatment of phthisis, while it has a stimulating and tonic effect in all debilitated conditions. Cold, dry air is particularly beneficial in chronic catarrhal conditions of the lungs, and hot air, applied locally, has had good results in the treatment of lupus, and in inflammatory conditions of the nasal and laryngeal passages. Compressed air, when carefully regulated, is valuable in early tuberculosis, emphysema, anæmia, and heart disease because of its therapeutic and tonic effects, but in undue amount, as, for example, in the case of workers in caissons under compressed air, it has harmful results (see **CAISSON DISEASE**). Rarefied air, produced by exhausting glass bells, is employed locally to relieve congestion and inflammation by drawing blood to the surface of the body (the passive hyperæmia treatment), while the value of mountain air, which is, of course, rarefied, is well known. Oxygen is employed to relieve dyspnoea, cyanosis, and heart failure, and amyl nitrite specially for the spasm of angina pectoris; nitrous oxide, and the vapours of chloroform and ether are widely used as anæsthetics; while the vapours of sulphur and of mercury, absorbed by the skin, are used in the treatment of syphilis and of parasitic skin diseases.

AERSCHOT (50° 57' N., 4° 49' E.), village, on Demer, S. Brabant, Belgium.

AERTSEN, PIETER (1507?-1575), 'Pietro Longo,' 'Lange Pier,' Dutch artist; painted famous Kitchen-pictures.

AESCHI (46° 39' N., 7° 42' E.), small town, Switzerland.

ÆSCHINES (IV. cent. B.C.), Gk. orator and statesman; speeches rank next to those of his rival Demosthenes; member of embassy sent to Philip of Macedon (347), whose policy he defended against Demosthenes; exiled to Rhodes.

ÆSCHINES (V. cent. B.C.), Athenian philosopher; friend of Socrates; wrote dialogues on virtue, riches, death, etc.

ÆCHYLUS (525-456 B.C.), father of Gk. tragedy; b. Eleusis; fought in Grecian wars against Persia, and present at battles of Marathon, Salamis, Artemisium, and Plataea; began writing for theatre at an early age, and produced about seventy dramas, of which only seven survive: *The Suppliants*, *Persæ*, *Seven against Thebes*, *Prometheus*, *Agamemnon*, *Choephora*, and *Eumenides*. He was the greatest of Gk. tragic poets and differed from his rival Sophocles in that his plays deal with the larger issues of fate, and by their grandeur of conception, while Sophocles deals more particularly with the personal amenities of human life. Tradition tells that he was warned he would meet his death by the fall of a house, whereupon he retired to the fields and was killed by an eagle letting a tortoise fall on his bald head.

Eng. trans. by Lewis Campbell, and Robert and E. B. Browning.

ÆSCULACEÆ, family of trees including horse-chestnut (q.v.).

ÆSCULAPIUS (classical myth.), god of medicine; s. of Apollo and Coronis; f. of HYGEIA (health) and PANACEA (all-healing). A. searched out the hidden powers of plants and herbs, and discovered cures for the various diseases which afflict mankind. He was slain by Zeus with a flash of lightning for having restored several persons to life.

ÆSERNIA, ancient Samnite town, Italy; ruins remain.

ÆSIR (Scandinavian myth.), children of Odin, Thor, Freyr, etc., who figure in the Eddas (q.v.).

ÆSOP, **ÆSORUS** (VI. cent. B.C.), Phrygian fabulist and philosopher; originally a slave, but received his freedom from his master, Iadmon; travelled through Greece and Egypt, and resided chiefly at court of Cræsus, king of Lydia. The Delphians accused him of having stolen a sacred vessel from temple of Apollo, and put him to death by hurling him from a high rock, 561 B.C.; famous for the fables, which were narrated by him on various occasions, but never committed to writing.

ÆSOPUS, CLODIUS, celebrated Roman tragic actor; friend of Cicero, and of comedian, Roscius; amassed large fortune; last appearance, 55 B.C.

ÆSTHESIOMETER, instrument to measure sensibility of body to touch.

ÆSTHETICISM, generally applied to the pose of complete attachment to æsthetic principles, whose apostle was Wilde (q.v.); an absurd and ephemeral side-issue of the æsthetic movement represented by Keats, Tennyson, Rossetti, and Morris; cleverly burlesqued in Gilbert and Sullivan's opera, *Patience* (1881).

ÆSTHETICS (Gk. *aiethetikos*, perceptible by senses), applied by Baumgarten, XVIII. cent., to science of taste or beauty, though used more nearly in Gk. meaning in Kant's 'Transcendental Æsthetic,' dealing with the conditions of sensuous perception.

Plato, following his ideal theory, affirmed an absolute beauty, from which was derived the beauty of particular things; Beauty not clearly separated from the Good and the True. Aristotle defined the beautiful as a mean between extremes, and resolved it into order, symmetry, definiteness, and a certain magnitude relative to the perceptive capacity. Art aimed at immediate pleasure, with no ethical purpose. In modern times Baumgarten limited æsthetics to the confused conceptions from the senses; the clear conceptions of truth were apprehended by reason, the higher intellectual power. Lessing (*Laocöon*) distinguished the provinces of poetry and painting, and excluded from the plastic art the representation of the repulsive. Kant affirmed the subjectivity of beauty and defined it according to his categories; the beauty of art inferior to that of nature. According to Schelling, the identity of subject and object is clearly seen only in artistic perception. Hegel affirmed the beautiful to be the realisation of the abstract ideal; the appearance of the Idea in a sensuous medium. Schiller, Winckelmann, Fichte, and Herbart have also written on the subject. In Britain inquiry has been mainly concerned with the æsthetic emotion, regarding beauty either as objective, a single unanalysable attribute, or as a complex growth by association from simpler elements. The principal writings are those of Shaftesbury, Hutcheson, Burke, Reynolds, Alison, Reid, Stewart, Ruskin, and Spencer.

Æsthetic experience is characterised by a passive contemplative attitude, pure enjoyment free from painful elements of conflict or fatigue, detachment from practical interests and from arduous mental activity. Æsthetic judgments appear uncertain and subjective, yet on comparison show a certain degree of uniformity. In constructing a science of æsthetics, beauty is not to be taken as, like colour, an inherent physical quality, but as external to the sum of physical properties. It is derived from at least three sources, sense experience, form or relation of parts, ideal content. Allied to it are the conceptions of gracefulness, prettiness, the ludicrous and the sublime. Hence æsthetics must not assume an objective quality of beauty, but, returning to Kant, merely examine the æsthetic qualities of objects, i.e. their power to affect us in a certain desirable way. This involves the investigation of such problems as æsthetic

effect, the æsthetic attitude of mind as a whole, the relation of intellectual to æsthetic enjoyment, the importance of sight and hearing in æsthetic experience, and the part taken by the other senses. Examination must be made of æsthetic experiences, the rudimentary ones of children and savages, and those of artists and critics of specially developed tastes. The analysis of æsthetic objects is the work of the psychologist. Taking each source of beauty in turn, the sensuous factor requires the investigation of the æsthetic characteristics of sensations of sight and hearing, of fine gradations of colour and tones, and of their capacity for combination while retaining their separate individuality. The analysis of form deals with all combinations of elements yielding pleasing relations, with harmonies of colour, with symmetry, and with the influence of the feeling tones of combining elements on the pleasing character of the whole. Lastly, all that imagination adds to our æsthetic enjoyments must be examined, the concrete experiences associated with objects, the poetic contemplation which attaches fanciful meanings to natural objects, the variation of this factor among different peoples and individuals.

Closely connected with the æsthetic feeling are the complex sentiments of the sublime and the ridiculous. The feeling of the sublime is a peculiar emotion, aroused by the presentation to sense or imagination of immeasurable vastness in space or time, or of transcendent physical or moral power. It involves at first a vague bewilderment, then a kind of religious awe, a wondering pleasure in the immensity contemplated, a feeling of personal elevation. The feeling of the ludicrous is based on a sense of one's own superiority; in matters more purely intellectual it is excited by the incongruous or grotesque. Humour contains this feeling blended with sympathy.

Bosanquet, *History of Aesthetics*.

ESTIVATION (zool.), state of torpor undergone by some animals, e.g. snails, during the hot season, contrasted with hibernation; (bot.) folded arrangement of a flower bud before summer.

ÆTHELFLED, dau. of Alfred the Great; m. Æthelred, Earl of Mercia; sent expedition against Welsh; constantly in conflict with vikings.

ÆTHELFRIITH (fl. 600), king of Northumbria; s. of Æthelric; m. dau. of Ella, king of Deira; won great victory over Welsh at Chester, 614.

ÆTHELING, Anglo-Saxon term applied to those of noble or kingly birth, almost exclusively confined to sons of royal family of Wessex.

ÆTHELRED (d. 716), king of Mercia; ravaged Kent, and destroyed abbeys and churches; afterwards abdicated (704), and became abbot of Bardney.

ÆTHELRED I. (866-71), king of West Saxons; s. of Æthelwulf; won great victory over Danes at Ashdown; succ. by bro., Ælfred the Great.

ÆTHELRED II., 'THE UNREADY' (968-1016), king of the English; succ. 979; 'unready' or 'red- less' means lacking in counsel; adopted foolish policy of buying off Danish invaders; m. Emma, dau. of Richard, Duke of Normandy, thus paving way for Norman Conquest.

ÆTHELSTAN (895-941), Saxon king; s. of Edward the Elder; grandson of Ælfred the Great; succ. 925; won brilliant victory at Brunanburh over allied Celts and Danes; praised by chroniclers as wise and vigorous ruler.

ÆTHELWEARD (c. 991), Anglo-Saxon historian; wrote Latin chronicle of Saxon kings to reign of Edgar, abridged from Bede's *Ecclesiastical History* and *Anglo-Saxon Chronicle*.

ÆTHER, **ETHER**.—From early times philosophers have recognised the necessity of the existence of some medium filling all apparently empty space; hence various 'æthers' have been supposed to exist, the properties of which varied according to the physical phenomena for whose explanation they were necessary. The only æ. theory to survive is the one invented by

Huygens to explain the propagation of light. More recent work has shown that the properties necessary for the propagation of light are just those required for the explanation of electro-magnetic phenomena. The modern view is that the whole universe consists of a perfectly continuous, incompressible medium, as a whole completely at rest, frictionless and unresisting to the ordinary motion of matter through it. The medium possesses considerable rigidity, which property might be conferred on it if throughout the whole medium there exists a system of vortex filaments or rings of exceedingly small dimensions. The elasticity of the æ. is regarded as 'perfect.' The property of the æ. analogous to rigidity is probably electric in its origin, and it is accompanied by a quasi-inertia, which has to do with magnetism. The two properties together enable transverse electro-magnetic waves to be transmitted through it at a definite speed. The inertia of the æ. corresponds to density in the case of ordinary matter, and it is possible that the inertia or density of the æ. is exceedingly great, much greater than that of any known material.

Is **THE ÆTHER AT REST**?—The theory of a motionless æ. was at first unable to explain the negative results of Michelson and Morley's experiment (*Phil. Mag.* xxiv. [1887], p. 449), which seemed to show that the æ. near the earth was carried along with it; but FitzGerald's hypothesis overcame the difficulty. He supposed that the dimensions of material bodies are slightly altered when they are in motion relative to the æ. The idea has gradually extended, and is now generally taken as the basis of all theoretical investigations on the motion of ponderable bodies through the æ.

J. Larmor, *Æther and Matter*; O. Lodge, *Modern Views of Electricity*; Whittaker, *History of Theories of Æther and Electricity*.

ÆTIOLOGY, the philosophy of CAUSATION (q.v.).

ÆTION (c. 350 B.C.), Grk. painter; exhibited at Olympic games; referred to by Cleero and Pliny.

ÆTIUS.—(1) (fl. 350 A.D.) Founder of Anomæan sect of Arians. (2) (d. 454 A.D.) Rom. general; long defended Empire against Barbarians; defeated Attila at Châlons, 451; assassinated by Emperor Valentinian III., through jealousy.

ÆTNA, see **ETNA**.

ÆTOLIA (38° 35' N., 21° 45' E.), region, Greece. Central plain is agricultural district; N. and E. mountainous; highest peak, Kiona (8240 ft.). Inhabitants in IV. cent. B.C. formed Ætolian League, which was joined by several northern cities and attained control of central Greece; aided Syria against Rome; subsequently came under Rom. control; later held successively by Venetians, Turks, Greeks; A. with Acarnania (q.v.) forms department of modern Greece.

ÆTOLIKON, **ANATOLIKON**, coast town, Ætolia, Greece; currents.

AFAR, see **DANAKIL**.

AFFIDAVIT, declaration upon oath, in the form of a signed statement, affirmed before a magistrate or commissioner to administer oaths.

AFFILIATION, action taken by mother of a bastard child to secure support from its putative father; an order is usually made for an allowance of 5s. per week until child reaches age of thirteen; see Lushington, *Law of Affiliation and Bastardy*.

AFFINITY.—(1) Relationship of husband to wife's blood relations or of wife to husband's blood relations; distinguished from kinship (consanguinity); certain degrees prevent intermarriage; *Prayer Book* table of proscribed degrees confirmed for England by Act, 1835; modified by Deceased Wife's Sister Act, 1907.—(2) Metaphysical term for occult relationship.—(3) Chemical attraction of elements tending to formation of compounds.

AFFINITY, CHEMICAL, the attraction between certain elements to form compounds. See **CHEMISTRY**.

AFFIRMATION, solemn declaration by those (e.g. Quakers) who, on a point of conscience, refuse to take an oath (q.v.).

AFFORESTATION, see **FORESTRY**.

AFFRE, DENIS AUGUSTE (1793–1848), abp. of Paris; moderate man, killed at 'barriados' in appealing for peace.

AFFREIGHTMENT, contract by which a shipowner undertakes to carry goods for a merchant, or other person, at a fixed charge, called *freight*, and deliver same in good condition to port of destination, subject to such reservations as 'act of God,' shipwreck, attack of pirates, etc. The particulars of agreement are set forth in a Bill of Lading (B/L), furnished by the shipowner to the shipper.

AFFRONTE, heraldic term—facing the front.

AFGHANISTAN, country, Central Asia, extends from 30° to 38° 20' N., from 60° 30' to 74° 30' E.; greatest length from E. to W. c. 600 miles; from N. to S. c. 500; area, c. 230,000 sq. miles; bounded on W. by Persia, N. by Russ. Turkestan, E. by tribes under Brit. influence and India, S. by Baluchistan. Main features are sand, rocks, hills, snow-topped mountains; surface rugged, much of it covered by offshoots from Hindu Kush, Koh-i-baba, Safed Koh, Siah Koh, and Sulaiman Mountains; plateaus between vary from 4000 to 7000 ft.; temperature depends on elevation; climate in higher districts very hot in summer, very severe in winter; N. drained by Oxus and tributaries, N.W. by Murghab and Hari-Rud, S. and S.W. by Helmand and Argandab, S.E. by Kabul, Kuram, and Gomal. Rainfall is slight; many valleys fertile, producing fruits and grain; two harvests every year; castor-oil plant, madder, and gum-yielding plants abound. Fauna includes leopards, jackals, tigers, bears, gazelles.

History.—In V. cent. B.C. A. was occupied by Sarangians, Arians, and other peoples. In IV. cent. Kabul valley invaded by Alexander the Great; in III. cent. Gk. dynasty founded at Bactria, power probably extending throughout Afghanistan; country under Rom. control for time, subsequently passing to Parthians, Persians, Saracens in succession. In X. cent. A.D. Kabul was owned by Turk, Sabuktigin, who made Ghazni capital, descendants ruling till XII. cent., when another dynasty, said to be first of Afghan race, was founded by Alanddin. A. was for short time subject to Khwarizm; conquered by Jenghiz Khan, middle of XII. cent.; remained under Mongol control for over cent.; conquered towards end of XIV. cent. by Timur, Oriental conqueror, remaining in hands of his descendant till 1501; another descendant, Baber, took Kandahar, 1522; from 1526 Kabul and Kandahar formed part of Mogul Empire of Delhi founded by Baber. In 1738 Nadir Shah conquered A.; after his murder, 1747, Ahmad Khan became king; founded Durani dynasty. In first half of XIX. cent. Dost Mahommed of Kabul tried to obtain Brit. aid against Persia; but British, suspecting him of treachery, waged war against him, dethroned him, and restored Durani ruler, Shah Shuja. This led to conspiracy; massacre of British occurred, 1841; British had to make treaty with Afghans and evacuate country. Second Afghan war broke out, 1878, in consequence of Amir Shere Ali's refusal to receive Brit. mission; British invaded A., Nov.; Amir soon fled; treaty made with s., Yakub Khan, whereby Britain attained control of Afghan foreign policy and stipulated for residence of envoy at Kabul. Soon afterwards Brit. resident, Cavagnari, and others were massacred; troops again sent; Kabul, Kandahar, and Ghazni taken, Yakub Khan imprisoned. British recognised Abdur-Rahman as Amir, 1880; almost immediately, Ayub Khan, bro. of Yakub Khan, raised army, defeating British at Maiwand; routed by Roberts, and subsequently by Abdur-Rahman, 1881. Following years were marked by differences between Russia and Britain concerning Afghan northern boundary; settled by diplomacy, 1885. Abdur-Rahman remained loyal to Britain; succ. by Habiballah, 1901.

Mineral resources await development. Chief industries are manufactures of silk, carpets, woollen cloth,

postins (sheepskins made for soft pelisses), camel- and goat-hair fabrics; exports silk, carpets, madder, gums, fruits, grain, cattle; imports cotton fabrics, dyes, sugar, tea, etc.; large transit trade from Persia, Turkestan, India, to Herat and Kabul. Transport is by camels and horses; no good roads except Brit. military roads; short railway at Kabul; rivers not navigable. Chief towns: Kabul, Kandahar, Herat, Ghanzi. Pop. c. 4,000,000, of whom c. 3,000,000 are Pathans. Prevailing language is Pushtu; Persian is spoken by many of non-Pathan inhabitants, and is court language. Religion is Muhammadan. Education is still in elementary state. Government is in hands of hereditary absolute monarch, called the Amir, whose council consists of sirdars, khans, and mullas. Country is politically divided into five provinces, Kabul, Turkestan, Herat, Kandahar, Badakshan, each under gov. Army consists of about 50,000 regular troops. See PERSIA.

Hamilton, *Afghanistan* (1906).

AFGHAN TURKESTAN (36° N., 66° E.), province, Afghanistan; area, c. 57,000 sq. miles; chief town, Mazar-i-Sharif; dependency of Kabul. Pop. c. 750,000.

AFIUM-KARA-HISSAR (38° 46' N., 30° 29' E.), town, Asiatic Turkey. Pop. 18,000.

A FORTIORI (L.), from more conclusive reasoning; still more.

AFRAGOLA (40° 45' N., 14° 25' E.), town, near Naples, Italy; straw hats. Pop. 22,000.

AFRANIUS, LUCIUS (fl. 100 A.C.), Latin comic poet; introduced national scenes on Rom. stage.

AFRANIUS NEPOS, Rom. general and consul (60 A.C.), supporter of Pompey.

AFRICA, most southerly and second largest continent of Old World, extends from 37° 21' N. to 34° 51' S., and from 51° 27' E. to 17° 33' W.; greatest length, c. 5000 miles; greatest breadth, c. 4500 miles; area, c. 11,800,000 sq. miles. A. approaches Europe at Strait of Gibraltar, N.W. corner, and touches Asia at Isthmus of Suez in N.E. corner. Off S.E. coast is large island, Madagascar; Canaries off N.W. coast; coast-line singularly unbroken, length about 18,000 miles; principal inlets, Gulfs of Cabos and Sidra on N., Gulf of Guinea with Bights of Benin and Biafra on W. Land rises rapidly from coast; from fairly continuous outer rim of mountains greater part of surface spreads inwards in two tablelands, of which the southern has mean elevation of over 3500 ft. and slopes down to northern, which has mean height of c. 1300 ft.; latter in some parts falls still lower, part of N.E. Sahara being below sea-level. Higher plateau has number of ridges, and in equatorial regions are many craters of extinct volcanoes, such as Kilimanjaro (20,000 ft.) and Mount Kenia (18,500). Chief mountain ranges near coast are Atlas on N. and Drakensberg, S.E. Along eastern part of plateau are many large lakes: Lake Rudolf, Albert Nyanza, Albert Edward Nyanza, Victoria Nyanza, Tanganyika, Moero, Bangweolo, Nyasa.

N.E. is drained by Nile and tributaries, S.W. by Zambesi, Shire, Limpopo, etc.; principal W. coast rivers, Senegal, Gambia, Volta, Niger, and Benue, Ogowe, Congo, Kwanza, Kumene, Orange, Vaal.

Rainfall is slight except near Equator and parts of coast; rainiest region, W. of Mount Kamerun; interior exposed to dry winds, known variously as *sirocco*, *kumsin*, *harmattan*; tropical districts unhealthy. Typical flora: date-palm in Sahara; mangrove on coast; india-rubber trees, copper plants; many orchids, and in S. heaths. Fauna includes lions, leopards, panthers, jackals, hyenas, elephants, rhinoceri, hippopotami, giraffes, camels, buffaloes, zebras and antelopes, baboons, gorillas, crocodiles, pythons, ostriches, secretary birds, locusts, and *tsetse* flies, many of which are peculiar to A.

Geologically, A. is old, and its stability is disturbed neither by great earthquakes nor by volcanic eruptions. Slight earthquakes at times disturb the comparatively

new) Atlas regions, and volcanic eruptions the coast-lands round the Bight of Biafra, and an eastern belt from Kilima-Njaro to the Red Sea. A vast connected but irregular area (the bulk towards the east) is covered by archæan rocks, gneisses, schists, and granites; recent deposits cover the greater part of Fr. W. A., and parts of Algeria, Tunis, and Tripoli; and Cretaceous rocks bulk largely on the Moroccan coast and parts of Tripoli and Egypt.

Political Divisions.—

Africa has been parcelled out among Britain, France, Germany, Belgium, Italy, Portugal, Spain. Britain possesses Basutoland, Bechuana-land, East Africa Protectorate, Gambia, Gold Coast, Lagos, Nigeria, Nyassaland, Rhodesia, Sierra Leone, Somaliland, Swaziland, Uganda, Union of South Africa (Provinces of Cape of Good Hope, Natal, Orange Free State, and Transvaal), Welsh Bay, Zanzibar, and has in her sphere of influence Egypt and Egyptian Sudan; total area about 3,600,000 sq. miles. France has Algeria, Fr. East Africa, Fr. Equatorial Africa, Fr. West Africa, Madagascar, Sahara, Tunis, and Protectorate in Morocco, in all c. 4,000,000 sq. miles. Germany has Ger. East Africa, Ger. South-West Africa, Kamerun, and Togoland (Upper Guinea), about 1,000,000 sq. miles. Belgium has Bel. Congo (formerly Congo Free State), 900,000 sq. miles. Italy has Erythrea, Tripoli, and Italian Somaliland, about 600,000 sq. miles. Portugal has Angola, Portug. East Africa, and Guinea, about 790,000 sq. miles. Spain has Rio de Oro and Muni River Settlement, about 90,000 sq. miles. Abyssinia with 370,000 sq. miles, Liberia with 52,000 sq. miles, are independent states. Total pop. c. 164,000,000.

Peoples.—Majority of inhabitants are negroes, of whom two main groups occur—negroes proper in northern half and Bantus in S. of continent. Negroes proper have many different languages, while Bantus all speak Bantu dialects. Other inhabitants include Bushmen, Eastern Hamites, Libyans, Semites, while intermingling has resulted in large number of tribes of mixed race. Bushmen are brown nomadic race of hunters, and with the Hottentots, who are said to be racially akin to them, formerly inhabited Cape Colony, but were driven north to Kalahari desert; Libyans, or Berbers, white race, occupy Algeria and Morocco; and Semites, or Arabs, are found in E.

and N.E. Semito-Hamites chiefly inhabit Abyssinia. Equatorial regions from Uganda to the Gabon are inhabited by Pygmy people, dark brown race of hunters concerning whom little is known. Original African stocks are generally supposed to have been negroes and bushmen, of whom former probably had original home near the large lakes, while latter have been put down as primeval inhabitants of southern regions. Hamites apparently spread from Horn of



Africa, and enforced emigration of negroes whose subsequent mingling with Bushmen probably produced Hottentots. Libyans coming from N. also intermingled with negroes, which resulted in production of Fulas. A most important migration was that of Zulu tribes towards N., chief tribes being Matabele and Angoni. Madagascar was early occupied by Malayo-Indonesian race known as Hova, who are still chief group of its pop., others being Malagasy and Negroid tribes.

History—Ancient Times.—When the Greeks visited the southern continent they found the two civilised states of Egypt and Ethiopia planted at the corner of a vast country which they named *Libya*; they drew their knowledge of Libya principally from Egyptians and Carthaginians. Herodotus relates that an Egyptian king was said to have sent out an expedition, c. 610 B.C., which circumnavigated Africa. The Romans named this country *Africa*, adopting the Carthaginian word, which may have meant colony or been derived from *pharika*, country of fruit, or from name of Berber tribe of Aouraghen, formerly *Aouragha* pronounced Africa).

A., excepting the northern strip, is a continent without a history; ethnology goes to prove that primitive population consisted of pigmies, who still remain in Central Africa; negroes believed to be immigrants who entered from Arabia; immigrants from Asia are supposed to have conquered original population of Upper Egypt before being subdued themselves by Negada dynasty in IV. millennium B.C. Egyptians, Phoenicians, and Greeks established first settlements known to history. Egypt conquered by Persians, 525, submitted to Alexander the Great, 332, and remained under Macedonian rule till 30, when it was conquered by Rome and became province of Egypt. Greeks founded famous city of Cyrene, near Egyptian frontier, in VII. cent. B.C.; it became head of district *Cyrenaica*, over which Ptolemies of Egypt established suzerainty, 322; leadership of African civilisation passed from Cyrene to Alexandria; district annexed by Rome, c. 95; revolts quelled, 67, after which it was formed into province with Crete; 200,000 Greeks and Romans in Cyrenaica massacred by Jews in time of Trajan, who laid waste country; consequently Hadrian founded new colony, Adrianopolis, there.

Phœnicians, Semitic race so named by Greeks, made settlements in North-West Africa in III. millennium B.C. Utica, their early capital, was flourishing about 2000, and Carthage ('New Town') was built towards close of IX. cent. B.C.; opposed Gk. commercial and colonial encroachment; aided Persians, but received defeat by Gelo at *Himera*, 480; won hegemony over North African tribes about this time; made treaties in IV. cent. with Rome, which recognised Carthaginian rule in Libya and Sardinia; First Punic War, 264-241, by which Carthage lost Sicily; Rome established suzerainty by Second Punic War, 218-201; Third Punic War, 149-146, resulted in destruction of Carthage and formation of Roman province of *Africa*, 146. West of the Carthaginian state were nomad Ethiopian settlement of *Numidia* (now Algeria), whose monarchs claimed descent from Hercules, and, west of *Numidia*, the nomad state of *Mauretania* (now Morocco); eastern *Numidia* was annexed by Rome and named *Africa Nova*, 46, but *Mauretania* remained independent; habit grew of calling all North Africans *Mauri* or Moors.

North Africa.—The history of northern Africa can now for several cent's be divided into periods of rule by different conquerors—

(1) **Roman Rule.**—The African province was governed by a praetor or pro-praetor; after establishment of New Africa, a proconsul governed both countries; Caligula divided them, 37 A.D., giving charge of frontier harassed by Moors to *legatus pro praetore* and leaving east with proconsul; district formed into four provinces by Diocletian under gov's of different standing; these four with *Mauretania Sitifensis* and *Mauretania Caesariensis* became diocese of Africa under rule of legate of pretorian prefect of Italy; most completely Romanised of all Roman provinces; Christianised; large cities were heads of many bishoprics and produced famous fathers, Tertullian, Augustine, etc., who moulded Latin Christianity, and philosophers such as Apuleius; home of numerous sects which split Early Church; notorious also for luxury and vice.

(2) N. Africa was easily conquered by **VANDALS**,

who landed in great numbers, 429; treaty by which only *Mauretania* and western *Numidia* remained to Rome, 442; invaders hated as *Arians*, never fused with conquered, and were finally overthrown by East Roman (Byzantine) armies under Belisarius, 534; province placed under praetorian prefect, who was also *magister militum*.

(3) **Arabian Rule.**—Egypt conquered, 641, by Muhammadans, who drove Byzantines from N. Africa by end of cent. and extended empire into Spain, 712; they were absorbed by conquered population and made permanent home; many Berbers remained distinct, accepted Muhammadanism, and became rivals of Arabs; conquest of Spain largely due to Arabised Berbers and *Mauretania* (Morocco) shared in brilliant Moorish civilisation of Spain; invaders were nomads and pressed farther south than Romans had done, trading with Sudan. Arab empire soon broke up; Morocco, preponderatingly Berber, became separate Arab state with capital at Fez (founded 806), and other districts followed; reunited under Zetrites of Egypt at close of X. cent., but there were frequent risings, especially of Morocco. **NORMANS** captured coast-line from Cape Bon to Tripoli, 1148-48, but all Christian inhabitants were expelled, 1159; Tunis became finally independent, 1208, *TLAMOUN* (nucleus of future Algeria), 1248, Morocco, 1269; Christian crusaders repelled by fleets of these 'Barbary States' until XVI. cent.; capitulation of Granada to Spain, 1491, led to great influx of Moors, who continued war from their new homes and were punished by Span. invasions; Algiers and Tripoli were conquered by Spain, 1510; Tunis sacked, 1535.

(4) **Turkish Conquest.**—The Turks had already taken from Arabs leadership of Islam and seized many of their states; Egypt fell, 1517, and they subsequently established regencies of Algeria, Tunis, and Tripoli; Morocco continued independent development as purely African state, extending south, 1588, and occupying Timbuctoo. North Africa lost prosperity during Turk. occupation, but Span. incursions were stopped and Barbary states freely exercised daring piracy until XIX. cent.

(5) **French Conquests.**—N. Africa was object of Christian concern from VII. to XIX. cent. Napoleon heralded occupation by conquest of Egypt; French invaded Algeria, 1827, subdued provinces after 30 years' fighting, and occupied Tunisia, 1881; in 1904 Britain recognised Fr. pre-eminence in Morocco; Germany refused to do so, but at last followed suit, in return for part of Fr. Congo, 1911; Spain also secured several ports and districts in Morocco. Franco-Turkish Boundary Commission, 1910-11, surveyed western frontier of Tripoli. France has extended influence south over Sahara, and recently M. Bonnel de Mézières has discovered grave of Major Gordon Laing, who reached Timbuctoo, but was murdered there, 1826. Egypt after Napoleonic conquest and Brit. occupation again became a Turkish state and extended S. in eastern Sudan; Britain and France established, 1882, a Dual Control, abolished 1883; since occupied by Great Britain. The Turco-Italian War, 1912, gave Italy Tripoli and Cyrenaica.

Central and South Africa.—The history of the DARK CONTINENT is that of exploration and colonisation.

(1) **Egyptian.**—Egyptians had knowledge of Ethiopia; not certain how far they progressed up Nile; expedition sent by Red Sea, c. 1200 B.C., to 'Punt' Expedition, c. 610 B.C., round African Continent remains doubtful. (2) **Phœnician.**—It is suggested that gold-country called *Ophir* in Bible was that of Zambesi; west coast explored to south of Sierra Leone.

(3) **Alexandrian.**—Under Ptolemies, Abyssinia was explored; map of Ptolemy the astronomer, c. 140 A.D., shows increased knowledge of E. coast and sources of Nile; he drew the great lakes and the Nile rising in Mountains of the Moon; possibly explorers of that date possessed knowledge lost until

late XIX. cent. (4) *Arabs* founded cities in Abyssinia and Sudan, and traded as far as mouth of Zambesi.

(5) *Portuguese*, 1415-1580.—Prince Henry the Navigator captured Ceuta, 1415, and Portuguese began to descend west coast; endowed by pope with country between Cape Bojador and Indies, 1443, when gold and slave trades began; equator crossed, 1471; Portug. sovereign assumed title 'lord of Guinea'; first colony, 1482; Congo reached, 1484; Cape of Good Hope doubled by Diaz, 1488; Abyssinia explored by Covillham; Vasco da Gama sailed by Cape to India, 1498; east coast from Delagoa Bay to Gulf of Aden settled, 1505-20; alleged cession of mining rights by 'Emperor of Monomotapa,' 1630 (?), but Portug. trade decayed after annexation by Spain, 1680; power destroyed by Arab risings, etc.

(6) *European Powers* to 1876.—First English reached Gold Coast, 1582; Eng. African Co., chartered 1588, sent several expeditions to Gambia in search of Timbuctoo; British Co. received charter, 1662, Royal African Co., 1672, African Company of Merchants, 1750. Holland established forts on west coast from 1595 and became deadly rival of all other powers in XVII. cent.; chief settlement at Cape Town, 1652; French spread up Senegal; Prussians established forts on W. coast, Austrians on east. Great change brought about at close of XVIII. cent. by anti-slavery agitation; trade forbidden to Dan. subjects, 1792, to British, 1807; quickly abandoned by other powers; Republic of Liberia founded for freed slaves and natives, 1820.

Modern SCIENTIFIC EXPLORATIONS commenced with Bruce's journey up Blue Nile, 1770-72; London 'African Association' (absorbed by Royal Geographical Soc., 1831), founded 1788, sent out Mungo Park, who reached Niger, 1795; Dutch finally ceded Cape Colony to Britain, 1814; unsuccessful expedition to Congo, 1816; brothers Lander discovered mouth of Niger, 1830; Brit. influence established there; Dutch from Cape Colony founded Transvaal, 1852, Orange Free State, 1854; Natal became separate Brit. colony, 1856. Missionary enterprise started modern 'scramble' for Africa; Burton, Speke, Grant, and Baker found traditional great lakes of interior, 1858-64, but it was David Livingstone who opened up Central Africa, 1848-73, reaching Luabala.

(7) *Partition of Africa* dates from Brussels Conference, 1876. Lead in new development was taken by Leopold II., king of the Belgians, whose name will always be connected with opening up of Congo. Conference resulted in foundation of International African Association; headquarters, Brussels; practically a private enterprise of King Leopold. Stanley's journey to find Livingstone resulted in his reaching the Congo; sent out by I.A.A. Committee for Exploring the Upper Congo, 1879; established Leopoldville and other stations; Brazza, sent out by French, commenced marking out Fr. stations on Congo, 1880; Portugal revived ancient claim to this region, 1882, and obtained guarantee of part from Britain, 1884; Lord Granville, however, was compelled to repudiate this treaty; international *Berlin Congress* resolved upon.

Relation of powers, 1884: France held Algeria and Tunis; France and Germany were attempting to oust Britain on Niger; France won upper, but Britain kept lower, stream. Britain had consolidated rule in S. Africa; Bechuanaland secured, 1884; influence supreme in Nyassaland, Matabeleland, Zanzibar. Ger. African societies founded in the eighteen-seventies concentrated ambitions on Niger and Congo, west coast trading stations, and trade with Zanzibar; encroachment in S. Africa; annexation of Angola Pequena, 1884, first important step of Ger. colonisation; Ger. protectorate of Togoland and Kamerun established 1884. *Berlin Congress*, 1884-85, agreed on: (1) free trade to all nations in Congo basin, on W. coast 2° 30' N. to 8° S., on E. coast 5° N. to Zambesi, and along certain route from Zambesi to Congo. (2) Free navigation of Niger. (3) Occupation to be valid must be effective.

Leopold II. became king of Congo Free State, 1885, and bequeathed it to Belgium, 1889; it was annexed by Belgium, 1908; Portugal on W. and Britain on S. at first disputed present boundary; Belg. aggression to N. resulted in Belg., Fr., and Brit. struggle for Upper Nile; Germany (in return for concessions in S. Africa) recognised western watershed of Upper Nile as western frontier of Brit. influence, 1890; Leopold II. confirmed this, 1894, in return for leases to which Germany and France objected; France occupied Fashoda, 1898; Egyptian government assisted by British obtained abandonment of Fr. claims, 1899, when boundary between Fr. and Brit. spheres of influence was agreed on; Belgium surrendered lease of Bahr-el-Ghazal, 1906. Growing rivalry of Germany showed itself; secret mission of Peters, 1885, when he founded German East Africa Co. and annexed Zanzibar with approval of Britain. Britain established colony of British East Africa, 1888-95, Uganda, 1890. British South Africa Co. chartered 1889 for development of territory now known as Rhodesia. After Boer War broke out, 1899, Orange Free State and South African Republic were annexed (1900) by Britain, becoming Orange River Colony and Transvaal Colony. These two colonies with Cape of Good Hope and Natal form UNION OF SOUTH AFRICA under South African Act passed by Parliament (September 20, 1909), the names of constituent provinces standing as Cape of Good Hope, Natal, The Transvaal, and Orange Free State.

Italy established influence over Eretree and Somaliland, 1870-91; France established colonies of Fr. Somaliland, 1856-87; Brit. Somaliland dates from 1884; Italy forced to recognise Abyssinian independence, 1896. Division of Guinea Coast between Portugal, Britain, and France was settled by treaties, 1885, 1886, 1892, 1907. Brit. Royal Niger Co. received charter, 1886; Britain recognised Fr. influence on Upper Niger, 1890; new agreement, 1899, granting concessions to France on Niger; Brit. Southern and Northern Nigeria formed, 1900.

LATER EXPLORATIONS.—After Stanley's travels Central Africa was explored by Hungarian scientist Holub, Keith Johnston, Thompson, Portug. Major Pinto and his assistants, Ivens and Capello, who explored Upper Zambesi (1877-84), and by Ger. expeditions under Pogge and Wissmann (1880-5), which have contributed much to knowledge of sources of Congo, also explored by Giraud, 1884, Grenfell, 1885, Lemaire, 1895-1900. Major Gibbons carried out surveys of upper and middle Zambesi, 1895-1900; district north of Zambesi and east of Congo explored by Thomson, 1878-84, and Giraud, 1882-84. Equatorial Nile region was explored by Meyer, 1887, Teleki and Höhnel, 1887-89, Emin Pasha and Dr. Stuhlmann, 1891, Götzen, 1893-94, Dr. Gregory, 1893, Scott Elliot, 1893-94, Hopley, 1896, Wollby, 1898-99, Mackinder, 1899, Donaldson Smith, 1899-1900, Austin, 1899-1901, Johnston, 1900, David and Behrens, 1903, Whitehouse and Powell-Cotton, 1904-6, Major Darley, Lieut. Aylmer, Dr. Kirchstein recently. Foucauld explored Morocco, 1883-84, and French have sent expeditions from Algeria and Senegal across Sahara to Upper Nigeria, etc., 1897-89 (Binger), 1890-92 (Monteil, Mizon, Crampel), 1896 (Gentil), 1900 (Fourreau), 1903-7 (Lenfant). Brit. commission under Lieut. Boyd Alexander crossed from Niger to Nile, 1904-6; his death followed by expedition of Miss M'Leod and Mr. and Mrs. Talbot, 1910-11. Abyssinia, Somaliland, etc., were explored by the James brothers, 1883, Bottego, 1892, Donaldson Smith, 1894-95. The African Continent was first crossed from S. to N. (Cape to Cairo) by E. S. Grogan, 1898-1900. See also SOUTH AFRICA and articles on separate states.

Sir H. H. Johnston, *History of Colonisation of Africa* (1899); Keltie, *Partition of Africa* (1895); Brown, *Story of Africa and its Explorers* (1892-94); Stanford's *Compendium, Africa*; Stewart, *Dawn in the Dark Continent* (History of Missions); Lucas, *Historical Geography of British Colonies*; Colvin, *Africa* (Romance of Empire Series).

SOCIAL AND ECONOMIC CONDITIONS.—A. long remained isolated from great world trade, partly because there was no way of communicating with interior of continent, but also because of unhealthy districts round coast, and inactivity of natives. Of these drawbacks first hardly exists any longer, and second has been greatly ameliorated. Progress of civilisation has led to increase of trade. A's chief resources are: jungle products, such as indiarubber, oil, timber of various kinds, gums, and nuts; fruits; cultivated plants, such as coffee, cotton, sugar, cereals, and tobacco; ivory, hides, wool, ostrich feathers, and other animal products; and minerals, such as gold, diamonds, tin, copper, iron, antimony, phosphates, lead. Means of communication have improved, and railways have been greatly extended. A transcontinental railway from Cape to Mediterranean is in process of construction. Telegraphic system is also well developed.

Africa, Rom. Province of, province formed from African empire of Carthage, annexed by Rome, 146 B.C.

AFRICAN LILY (*Agapanthus umbellatus*), belonging to the order Liliaceae, native of S. Africa, is cultivated in a number of varieties for its umbel of blue or white funnel-shaped flowers.

AFRICANUS, JULIUS (III. cent.), Christian historian and chronologist.

AFRIDIE, Afghan and Pathan mountain race commanding Khyber and Kohat passes; formidable rising following Brit. annexation of their territory put down in Tirah campaign, 1897-98.

AFRIKANDER, AFRICANDER, person born in S. Africa of European descent; term sometimes monopolised by Dutch-speaking people of S. Africa.

AFRIT, AFRIT (Arab. myth.), a powerful evil spirit.

AFTERGLOW, rosy or white glow in the western sky long after sunset, due to refraction by fine dust suspended in the higher regions of the atmosphere.

AFZALGARH (c. 29° 25' N., 79° E.), town, N.W. Provinces, India. Pop. c. 10,000.

AFZELIUS, ADAM (1750-1837), Swed. botanist; pupil of Linnaeus.

AFZELIUS, ARVID AUGUST (1785-1871), Swed. poet; trans. *Edda* and collected folk-lore.

AGA KHAN I., HIS HIGHNESS (1800-81), descended from royal house of Persia; gov. of Kerman under Shah Fatah Ali, whose jealousy he aroused; fled to India and sought Brit. protection; very helpful to Napier and to Brit. Government, from whom he received large pension.

AGA MUHAMMAD (1720-97), Shah of Persia; founder of Kajar dynasty.

AGADES (17° N., 8° 2' E.), capital of Air (or Asben), Sahara; formerly large city; grain.

AGADIR (30° 26' N., 9° 32' W.), town, Morocco, North Africa; best harbour on coast; decayed port. Germany in 1911 sent a cruiser to A., nominally to protect Ger. interests; Franco-Ger. crisis ensued. See Morocco.

AGAG, king of Amalekites; conquered by Saul and hewn in pieces by Samuel's order.

AGALMATOLITE, soft compact yellowish or greenish stone used by the Chinese for carving into figures, miniature pagodas, etc., hence also known as figure-stone or pagodite.

AGAMEDES, and **TROPHONIUS**, his bro. (classical myth.), celebrated architects; built temple of Apollo at Delphi.

AGAMEMNON, king of Mycenae; bro. of Menelaus; m. Clytemnestra; commander of Greeks in Trojan War; sacrificed his dau. Iphigenia (q.v.); murdered by *Ægisthus* (q.v.).

AGANA (13° 30' N., 144° 38' E.), capital, Guam Island, N. Pacific; naval station.

AGAPANTHUS, see **AFRICAN LILY**.

AGAPE (Gk. 'love'), love feast of the early Church. At first intimately connected, if not identical, with the Eucharist, but became quite separate and

finally extinct. It is described by Tertullian, Clement of Alexandria, pseudo-Athanasius, and Socrates. Sometimes it degenerated into mere feasting, if not debauchery. It was sometimes followed by the Eucharist. In the Georgian and Armenian Churches pagan sacrificial feast was taken over into the Church as an a.

AGAPEMONITES, sect founded by Rev. Henry James Prince, an Anglican curate, in 1846, on the idea that marriage should be purely spiritual. It was joined by Rev. Samuel Starkey (Prince's rector) and others, a church and an 'Abode of Love' built. There was much scandal, and Prince d. 1899. Rev. T. H. Smyth Pigott, his successor, proclaimed himself Messiah, 1902.

AGAR, **AGOUR** (23° 44' N., 76° 4' E.), fortified town, Gwalior, Central India. Pop. 30,000.

AGAR, see **BACTERIOLOGY**.

AGARDE, KARL ADOLF (1785-1859), and **JAKOB GEORG** (1813-1901), his s., Swed. naturalists, authorities on *algæ*.

AGASSIZ, ALEXANDER EMANUEL (1836-1910), Amer. scientist; s. of Louis A. (q.v.); voluminous writer on marine zoology.

AGASSIZ, JEAN LOUIS RODOLPHE (1807-73), Swiss naturalist; settled in America (1846); prof. of Zool. and Geol. at Harvard; achieved great success as lecturer on scientific subjects; pub. *Natural History of the Fresh-Water Fishes of Central Europe* (1839); *Contributions to Natural History of United States* (1857-62); *Journey in Brazil* (1868).

AGATE, siliceous mineral, being variegated chalcedony, occurring in rounded nodules, which are formed in cavities of igneous rocks by the deposition of silica in layers from percolating water. Iron or other oxides may produce red, brown, and other tints. On account of its hardness and the high polish it can take on, a. has been used as an ornamental stone, and for laboratory appliances, such as mortars and pestles and knife edges for delicate balances. The colours of a. articles for sale are frequently artificially produced.

AGATHA, ST. (d. 251), Christian martyr who resisted the overtures of Prefect Quintilianus sent by Emperor Decius to govern Sicily, and was by him cruelly tortured and put to death; festival, Feb. 5.

AGATHIAS (c. 536-82), Gk. poet and historian; composed love poems and wrote contemporary history of Justinian's reign.

AGATHO, ST., Pope (678-82).

AGATHOCLES (361-289 B.C.), tyrant of Syracuse; made war with Carthage; famous leader of mercenaries.

AGATHON (447-400 B.C.), Athenian tragic poet, rival of Euripides.

AGAVE, genus of tropical and W. Amer. plants, order *Amayllidaceae*, with fleshy, pointed, spine-margined leaves; they are very slow in attaining maturity and have a panicle of flowers on a tall stem growing from the centre of the leaf rosette. In Mexico sisal hemp is obtained from the leaves of fibrous species, and pulque, a fermented drink, is prepared from the juice of *A. americana* and other species.

AGDE (43° 18' N., 3° 28' E.), port, France, on Hérault, near sea; Synod of A., 506. Pop. c. 10,000.

AGE, period of time, from birth to given moment, as in stating age of person. Four ages of man: infancy, youth, manhood, old age. Infancy in Eng. law lasts till 14 years of age, though there is distinction between infants under and over 7 years, those under 7 being incapable of committing crime; 25 used to be considered termination of adolescence, now often placed at 28 or 30; old age commences, 55-60; legal majority, 21st birthday.

World has been divided on different systems into periods of time or 'ages'; great historical division in Palæolithic, Neolithic, Bronze, Copper, and Iron ages, the advance to use of iron tools being last step of civil-

isation. Greeks used metallic terms to symbolise moral changes in world since its commencement: Hesiod divided time into Gold Age, or Age of Cronos, time of virtue, happiness, and plenty, to which later ages looked wistfully back; Silver Age when, Zeus having overthrown realm of Cronos, virtue and happiness lost their first splendour; the Brazen Age of Poseidon, wild, turbulent period; the Heroic Age of Homer, from which Hesiod conceived that his own cruel and evil Iron Age had declined. Latin poets wrote much of Golden Age, which they called Age of Saturn.

Time is divided into different geological periods, as Glacial Age, and into zoological periods, as Age of Fishes, following scheme of evolution of animal forms ending with arrival of vertebrates. Chief historical division now used is that of Ancient History (q.v.) and Modern History, but early modern history is generally treated as two periods of Dark and Middle Ages (q.v.).

AGEN (44° 12' N., 0° 37' E.), cathedral town, France; agricultural market; appeal and assize courts. Pop. 22,000.

AGENAIS, **AGENOTS** (44° 20' N., 0° 25' E.), old province, France; often taken by English; now part of Lot-et-Garonne.

AGENT-GENERAL, representative in England of a Brit. colony whose business is to safeguard the financial and political interests of his colony in the Mother Country; the term 'High Commissioner' is used in the case of the Self-Governing Dominions.

AGESANDER (I cent. a.c.), sculptor of Rhodes; executed part of Laocoön group.

AGESILAUS II. (c. 445-360 B.C.), king of Sparta; reigned forty-one years; a great military commander; defeated Persians in Asia, allied Athenians and Thebans at Coronae (394); defeated by Epaminondas at Mantinea (362), but saved Sparta.

AGGLOMERATE (geol.), accumulations of coarse volcanic fragments occurring near a crater, consisting of rocks, often weighing many tons, dislodged from its walls, of large ashes and volcanic bombs created by rotation in the air of molten lava. Arthur's Seat, Edinburgh, is an example of a. in Britain. See **VOLCANO**.

AGGLUTINATION, in philology, forming a compound from two distinct roots, e.g. cowherd.—**Agglutinative Languages**, those in which words are formed by aggregation of roots which may be detrited into more suffixes and prefixes, as A.S. *like* becomes suffix *ly* in Eng. words; Turk. and Santali are perfect examples; different from inflectional languages, in which change of meaning is given by modification of word without addition of another.

AGGTELEK (48° 30' N., 20° 30' E.), village, Hungary; stalactite caves.

AGINCOURT, **AZINCOURT** (50° 27' N., 2° 9' E.), village, France; here Henry V. of England with small force, mostly archers, defeated Fr. army under d'Albret, Oct. 25, 1415, after three hours' fighting; French suffered heavy losses.

AGIRA (37° 40' N., 14° 30' E.), town, Sicily. Pop. 18,000.

AGIS, name of three or four Spartan kings (V.—III. cent. B.C.). **Agis III.** (338-331) rebelled against Macedonian supremacy during Alexander the Great's absence. **Agis IV.** (245-241 B.C.) sought by land and other reforms to save Sparta from impending ruin due to luxury, unequal distribution of wealth, etc.; thwarted and murdered.

AGITATORS.—In 1647, when Long Parliament wished to disband certain regiments whose pay was in arrear, the men, objecting to such treatment, elected 'agitators' or 'adjutors' from their ranks to lay their grievances before the authorities.

AGLAIA, see **GRACES**.

AGNADELLO, Ital. village near Cremona, where Louis XII. defeated Venetians, 1509.

AGNANO, **LAGO DI** (40° 50' N., 14° 13' E.), lake in volcanic basin, near Naples; drained, 1870.

AGNATES, relatives on paternal side, as dis-

tinguished from *cognates*, relatives on maternal side; in Rome, agnate meant one related through males and males only.

AGNELLO, **COL D'**, pass between France and Italy, S. of Monte Viso, connecting Durance and Po valleys.

AGNES, **ST.** (d. 303), according to tradition, Christian maiden (aged 13) of Rom. birth who suffered martyrdom at hands of Prefect Sempronius (during reign of Diocletian) because she refused to marry his heathen son; patron saint of virgins; symbol, a lamb; festival, Jan. 21.

AGNESI, **MARIA GAETANA** (1718-99), Ital. mathematician; Lady-Prof. of Math's and Natural Philosophy at Bologna (1750); later entered sisterhood of Blue Nuns, Milan.

AGNEW, **DAVID HAYES** (1818-92), Amer. surgeon; during Civil War noted for operations in cases of bullet wounds.

AGNI, Hindu fire-god; with Soma (q.v.) and Indra (q.v.) forms Vedic trinity.

AGNOLOGY, the study of ignorance with regard to its conditions and extent.

AGNOLO, **ANDREA D'**, see **SARTO**.

AGNOMEN, additional name conferred by Romans on noteworthy persons, e.g. Scipio *Africanus*.

AGNONE (41° 43' N., 14° 22' E.), town, Campobasso, Italy; copper. Pop. 10,000.

AGNOSTICISM, the belief of those who hold that there is no proof of the existence of a God, and that, if there is a God, His nature is unknowable; the term agnostic was first used by Huxley in 1869; distinguished from *atheism*, which denies God's existence.

AGNUS DEI ('Lamb of God'), figure of lamb bearing cross; discs or cakes of wax, silver, or gold employed by R.C. Church, bearing this figure, are so styled; name of prayer in Mass commencing, 'O Lamb of God, that takest away the sins of the world, have mercy upon us.'

AGOBARD (d. 840), abp. of Lyons; prominent figure of Carolingian period; opposed many superstitions, including belief in witchcraft and trial by ordeal.

AGONE, seaport, Dahomey, Slave Coast, W. Africa.

AGONIC LINES, imaginary lines on the surface of the earth connecting points where the magnetic needle points to the geographical poles; the line of no magnetic declination.

AGORA, in early times, an assembly of Gk. people; later their place of assembly, usually the market, or forum.

AGORDAT (16° 10' N., 37° 16' E.), fortified town, Eritrea, N.E. Africa; Italian victory, 1893.

AGOULT, **MARIE CATHERINE**, **Comtesse D'** (1805-76), Fr. authoress (*nom de plume*, 'Daniel Stern'), friend of Heine, de Vigny, Sainte-Beuve, Chopin, George Sand, and others; became mistress of Franz Liszt, their dau. Cosima afterwards marrying Richard Wagner; author of drama, *Jeanne d'Arc* (1857), and hist. and political works.

AGOUTI (*Dasyprocta aguti*), terrestrial rodents of the size of a rabbit, in tropical America; of nocturnal habits, dwell in forests and are destructive to banana and sugar-cane plantations.

AGRA.—(1) (27° 15' N., 77° 59' E.) Town, on Jumna, United Provinces, India; captured by Baber (q.v.) in 1526, the loot including the famous Koh-i-noor diamond; fort built by Baber's grandson Akbar; and completed, 1665; contains many fine buildings including the exquisite *Taj Mahal*, a mausoleum in white marble erected (1632) by Shah Jehan (q.v.) for his favourite wife—the nobility and beauty of the structure well merit the encomium, 'designed by Titans and finished by jewellers.' Pop. (1911) 185,500. (2) Also the name of a district, a division, and a province in the United Provinces. The Province has an area of 83,198 sq. miles. Pop. (1911) 34,624,000. See **UNITED PROVINCES**.

AGRAM, ZAGRAB (45° 50' N., 15° 50' E.), capital, Croatia, Hungary; archiepiscopal see; Univ.; linen, carpets, leather. Pop. (1910) 61,000.

AGRAPHA, sayings ascribed to Jesus which are not found in the Gospels.

AGRAPHIA, nervous disorder involving loss of power to express ideas in writing; akin to aphasia (q.v.).

AGRARIAN LAWS, ancient Rom. laws governing the use of state lands for pasturage or other purposes; purpose was to give every citizen his fair share in the public domain and prevent patricians from monopolising it. One of most important was the *Licinian law*, introduced by the tribune, Licinius Stolo (367 B.C.), which provided that every Rom. citizen should, by payment of a tax to the public treasury, have the right to graze 100 head of large, or 500 head of small, cattle upon unallotted state lands. A later law, introduced by Tiberius Sempronius Gracchus (q.v.) and known as the *Sempronian law*, provided that every f. of a family should have the right to occupy 500 jugera (acres), and 250 jugera additional for each of his sons. The passing of this law aroused the patricians' jealousy, which resulted in the assassination of Tiberius and his bro. Caius.

AGRARIAN PARTY, Ger. political party, advocating agricultural protection.

AGRAVAIN, SIR, knight of Round Table; bro. of Gawain.

AGRICOLA, GEORG, or BAUER (1494-1555), Ger. scientist; wrote on mining and metallurgy.

AGRICOLA, GNEUS JULIUS (37-93 A.D.), Rom. general and statesman; gov. of Britain, 78-85; subdued large part of Great Britain, winning many victories, including one over Caledonians as far north as the Grampians; established line of forts between Forth and Clyde; implanted Roman civilisation and customs; his successes aroused the jealousy of Domitian, and his later years were spent in retirement; life written by his son-in-law, Tacitus.

AGRICOLA, JOHANN, or SCHNITTER (1492-1566), Ger. Prot. reformer; at first strong supporter of Luther, but later quarrelled over Antinomian controversy.

AGRICOLA, RUDOLPHUS, or ROELOF HUYSMAN (1443-85), Dutch scholar; b. in Friesland; hence sometimes called *Frisius*; friend of Erasmus; laid foundations of humanism in Germany; wrote *Dialectica*.

AGRICULTURE is the science and art of producing plants and animals useful to man and, to a certain extent, the further preparation of these products. After hunting, it is the most primitive of human professions, and at first consisted in driving a herd to a suitable pasturage, and raising crops on a patch of ground till the soil became exhausted or other reasons caused the nomads to migrate elsewhere. This *extensive* husbandry gave way to a more economical or *intensive* culture with the widening of experience, on the discovery of the value of manures, of the fallow, of the advantages of a rotation of crops and the improvement in implements. It is a matter of course that the fertile land watered by rivers like the Hoang-ho, Ganges, Tigris, Euphrates, Nile, should have been cultivated and used for pasture from time immemorial. The Chinese, Babylonians, Egyptians, and Jews were noted for their pastoral husbandry and tillage before the Greeks and, to a far greater extent, the Romans brought farming to a high state of development. The latter people, as recorded by many authors, such as Vergil and Pliny, by the remains of irrigative works and other indications of agricultural industry, had expert knowledge of the value of different soils, manures, and crops, of stock-breeding, plant diseases, of bee-keeping, fruit-growing, and horticulture (q.v.). After the decline of the Rom. Empire the Saracens in Spain were most influential in promoting the progress of a., and in the restless Middle Ages the scattered monastic communities did much to foster the science and art of farming.

Varying social conditions, acting on different physical environments, make the development of present-day a. one of the most interesting and intricate of sociological problems. Legislation, the advance of science, industry and means of transport, the growth of the idea of co-operation are potent factors which are controlling the evolution of a. The opening up of new countries for wheat-growing, the decline of the rural population in industrialised countries, and the growing interdependence of different nations on one another are but a few of the phenomena of human history of importance to the present-day agriculturist, who has to be a scientist and political economist as well as a 'practical man.'

One of the earliest treatises on Eng. a., by Walter of Henley, describes the two- and three-field system prevailing in the XIII. cent. During the following cents. the increase in the demand for wool caused a rural depopulation in England owing to the conversion of arable land into pasture for sheep, and the growing enclosure of waste land. A great improvement is recorded from Elizabethan times, a number of writers (Fitzherbert, Tusser) on husbandry drawing attention to drainage, irrigation, rational manuring, and the value of clover and root crops. The increase of closed farms, together with the practice of liming and marling and the use of new implements and methods, indicated a growing prosperity in the first half of the XVII. cent., enhanced by the security following the union of the crowns of Scotland and England. During the civil wars, however, and the political disturbances which followed, Eng. husbandry suffered a severe depression. Scot. a. seems to have been on a low level until the end of the XVII. cent., kail, barley, and oats being the staple crops. After the Union (1707) a. progressed steadily both N. and S. of the Tweed. A Berkshire farmer, Tull, introduced the system of sowing crops in drills and demonstrated the value of horse-hoeing; Lord Townshend (1676-1738) advocated the growing of turnips and the four-course system which made the summer fallow unnecessary; and the Earl of Leicester (1752-1842) was responsible for the use of bone-manure and oil-cake and the rational utilisation of grasses. Owing to the activities of Robert Maxwell and the 'Society of Improvers in the Knowledge of A. in Scotland,' a more rational cropping was introduced, and grain crops began to be alternated with clover and turnips. The system prevailing in Scotland of letting land on long leases offered every inducement to both landlords and tenants to improve the land and share in the general prosperity of Brit. agriculturists consequent on the introduction of improved implements (e.g. Meikle's threshing-machine), better draining, and especially the extraordinary rise of prices during the Napoleonic wars. During the latter half of the XVIII. cent., too, stock-breeding was not neglected, and the names of Bakewell and Collins are associated with the improvement of the *Longhorn* and *Shorthorn* breeds of cattle, and a new race of sheep (*Leicesters*). A period of agricultural depression set in after European peace was restored, and lasted until about 1840, though much progress was made as regards farming machines and the introduction of new manures like bones and Peruvian guano.

The year 1843 is noteworthy because of the establishment of the Rothamsted agricultural experiment station by Sir J. B. Lawes, which has since gained world-wide appreciation. The Royal Agricultural Society had been incorporated a few years previously. A period of prosperity set in and lasted till 1848, the development of railways having the effect of opening up new markets. A depression followed; characterised by a drop in wheat prices, but after 1853 the country enjoyed a steady development and increase in agricultural prosperity for twenty years, though marred by an outbreak of rinderpest brought to England by Russ. cattle. New field crops (Ital. rye-grass, alsike, winter-beans, etc.) were introduced, and the

employment of steam power on farms became more general. Irish a. was still suffering from the effects of the failure of the potato crop in 1845 and the consequent reduction of the population by 2½ millions. The last quarter of the XIX. cent. was marked by bad seasons, excessive cold, rainfall or drought, a reduction of the wheat-growing area, and loss of stock owing to disease. On the other hand, much pioneer work was done, in spite of the depression, for instance, the introduction of Thomas's phosphate powder (basie slag) as a dressing for pasture lands, of copper sulphate solutions for destroying parasites and weeds, and other improvements affecting the crops, besides the employment of numerous tools and implements introduced chiefly from America. The creation of the Board of A. (q.v.) for Great Britain (1889) was a vital step affecting the development not only of the art but of the science of a. The Taxation of Land Values, the tendency towards co-operation between small holders, the increasing demand for dairy products, the introduction of highly intensive cultivation of vegetables (Fr. gardening), and the application of Mendel's law by breeders are but a few of the problems affecting a. at the present time and for many years to come.

Agricultural Colleges and Schools.—Special scientific training in a. dates from the establishment of the Royal Veterinary College in Copenhagen (1773). Forty-four agricultural high schools have been founded in Denmark since then which have greatly contributed to the prosperity not only of dairy-farming, but of the entire country. In the other Scandinavian states agricultural education has obtained a very high level, and by means of travelling instructors and experts the farmer in those countries can always profit by the intimate relations thus established between science and practice. Holland has a first-class agricultural coll. at Wageningen, and a fair amount of research work is carried on at the univ's. In Belgium and France agricultural education is extremely well organised, and special cheese-making, silk-worm, and horse-breeding schools have been established. Switzerland, 'the sociological laboratory of Europe', is provided with numerous schools for a., dairying, fruit-growing, and forestry, and the Polytechnicum at Zurich has flourishing departments for a. and forestry. The Ger. Empire provides agricultural instruction of all grades, and besides at many of the univ's and technical colleges agricultural training of univ. rank is provided at the High Schools of Berlin and Poppelsdorf. The six forestry schools are admitted to be the best in the world.

In Great Britain the first chair of a. was founded at Edinburgh Univ. in 1790, and a chair of rural economy at Oxford in 1796. Besides numerous smaller centres the chief agricultural colleges and institutes in England are at Cirencester, Tamworth, Carlisle, Preston, Uckfield, Wye, Holme Chapel (Cheshire), Kingston (Derby), Newport (Monmouth), Ridgmont (Beds.), Chelmsford, and at the Univs. or Univ. Colleges at Cambridge, Reading, Leeds, Bangor, Aberystwyth, and Newcastle-on-Tyne. The Board of A. and the County Councils also provide for instruction, and subsidise some of the departments mentioned. In Scotland flourishing agricultural colleges provide higher instruction at Edinburgh, Glasgow, and Aberdeen in addition to special departments at the Univ's of Edinburgh and St. Andrews. In Ireland higher education is provided at Dublin, Glasnevin, and Cork, and is supervised by the Department of A. and Technical Instruction for Ireland, which also supports four experiment stations and organises a number of winter schools and lectures. On the whole, it may be said that however high the standard of instruction is at many of the colleges, agricultural education in the United Kingdom shows a lack of co-ordination detrimental to the country as a whole. Canada, Australia, New Zealand, and South Africa are showing great energy in applying modern science to a., and the professional education is rising to a high standard. In India

instruction in a. and forestry is making rapid progress. The Department of A. of the United States as well as the States themselves maintain experiment stations at which not only research is carried on in bot., zool., chem., bacteriology, meteorology, and practical farming, but which act as centres of information to all who desire to profit by it. Besides instruction at many schools, the agricultural colleges and departments of the State Univ's provide for both research and teaching. In S. America, cattle-breeding in Argentina and Uruguay has been developing very rapidly, and agricultural education is at a high level in Brazil and Chile. Japan is coming to the fore in scientific a. and fishery, and already provides excellent facilities for higher education in those subjects. In Egypt an agricultural school was established in 1898. See CATTLE, DAIRY, FORESTRY, IRRIGATION, etc.

C. E. Green and D. Young, *Encyclopædia of Agriculture* (Edinburgh, 1907-8); J. H. Baily, *Cyclopædia of American Agriculture* (New York and London, 1907-8); Stephens, *Book of the Farm*, 3 vols. (Edinburgh, 1908); H. Rider Haggard, *Rural England*, 2 vols. (1902).

AGRICULTURE, BOARD OF (of Great Britain), was established by an Act in 1889, control of the Fisheries being added in 1893. It consists of a Pres. holding cabinet rank and *ex-officio* members including the majority of cabinet ministers, and a permanent staff under a sec. The chief functions of the Board are: to prevent introduction or spread of disease among certain animals; to administer any Act in connection with the holding of land, or with Fisheries; to promote the science of and education in a., horticulture, and forestry; and to supervise the Ordnance Survey of the United Kingdom.

AGRIGENTUM (37° 20' N., 13° 40' E.), ancient town, Sicily; founded by Gk. colonists from Gela, c. 582 B.C.; quickly rose in importance; had many famous buildings, including temple to Jupiter, of which ruins remain; ruled by tyrants, Phalaris (q.v.) and Theron (488-472); latter's s. Thrasydaus banished 472 B.C. when democracy established; destroyed by Carthage, 405 B.C.; reconquered by Timoleon, 338 B.C.; sacked by Romans, 261, Carthaginians, 225; again by Romans, 210 B.C.; henceforth subject to Rome; held by Saracens, 828-1086; birthplace of Empedocles; modern Girgenti (q.v.).

AGRIMONY (*Agrimonia*), genus of perennial herbs, order *Rosaceae*, with yellow flowers and fruits with bristly hooked hairs causing them to adhere to, and be transported by, animals. The name has also been applied to several unrelated plants.

AGRIMORI, VRACHOBI (38° 35' N., 21° 25' E.), small town, Acarnania, Greece; tobacco.

AGRIFFA, sceptic who lived after the age of Cicero; went so far as to dispute the evidence of all truth whatsoever.

AGRIFFA, HEROD, see HEROD.

AGRIFFA, MARCUS VIPSIANUS (63-12 B.C.), Rom. soldier, statesman, and patron of arts; favourite of Emperor Augustus, whose dau. Julia he m.; served with distinction at Actium and elsewhere; had Roman Pantheon built.

AGRIFFA, MENENIUS LATANUS, Rom. consul (503 B.C.); associated with famous fable of 'the belly and the members.'

AGRIFFA VON NETTESHEIM, HENRY CORNELIUS (1486-1535), Ger. alchemist and philosopher; reputed magician; in early life entered service of Maximilian I. of Germany; later historiographer of Charles Quint.

AGRIFFINA, THE ELDER (d. 33), dau. of M. V. Agrippa (q.v.) and Julia; wife of Germanicus (q.v.); exiled by Emperor Tiberius, and starved to death; of high moral character; mother of Caligula.

AGRIFFINA, THE YOUNGER (d. 59 A.D.), mother of Nero; poisoned her third husband, Emperor Claudius

(q.v.), to secure throne for Nero, who eventually, resenting her domination, had her murdered.

AGUADA (18° 20' N., 66° 10' W.), seaport, Porto Rico; coffee.

AGUADA, AGUADAS (5° 35' N., 75° 35' W.), town, Antioquia, Colombia. Pop. c. 13,000.

AGUADILLA (18° 31' N., 67° 43' W.), town, Porto Rico. Pop. 6425.

AGUADO, ALEXANDRE MARIE, Viscount de Monte Ricco (1784-1842), Span. Jewish soldier, banker, merchant, and art collector; naturalised Frenchman; acquired, amongst other estates, Château Margaux (vineyards); left great wealth.

AGUASCALIENTES (22° 2' N., 102° 30' W.), state, Mexico; warm springs. Pop. (1900) 102,000. Capital, *Aguascalientes* (21° 57' N., 102° 30' W.). Pop. 35,052.

AGUE, popular name for the paroxysm of intermittent malarial disease characterised by cold, hot, and sweating stages. See *MALARIA*.

AGUESSEAU, HENRI FRANÇOIS D', DAGUESSEAU (1668-1751), Fr. Chancellor; famous for learning and integrity, and held to be greatest master of legal eloquence of his period.

AGUILAR, AGUILAR DE LA FRONTERA (37° 30' N., 4° 37' W.), town, Spain; wine, olives. Pop. 13,236.

AGUILAS (37° 25' N., 1° 35' W.), port, Spain; exports esparto. Pop. 15,868.

AGUILERA, VENTURA RUIZ (1820-81), Span. poet; wrote elegies and satires of considerable charm.

AGUINALDO, EMILIO, leader of Philippine revolt against Spaniards; and after Span. Amer. War (1898) resisted Americans till capture in 1901.

AGULEHAS, CAPE (34° 40' S., 20° E.), most southern point of Africa; rocky and stormy; lighthouse; A. means the 'Needles' in Portuguese.

AHAB (c. 918-896 B.C.), king of Israel; m. Jezebel, dau. of king of Sidon, and by her influence introduced worship of Baal, priests of which were reproved by Elijah; killed by arrow in war with Syria.

AHASUERUS, name of the legendary Wandering Jew (q.v.).

AHASUERUS, title given to certain Median and Persian kings, of whom one was the husband of Esther.

AHAZ, king of Judah (741-c. 724 B.C.); Jerusalem being besieged, he called in aid of king of Assyria, who forced him to do homage and pay tribute.

AHAZIAH, king of Judah; s. of Jehoram; slain by Jehu.

AHENOBARBUS, Roman family, period of Julius Caesar, whose name means 'red-bearded'; Gnaeus Domitius Ahenobarbus was the Enobarbus of Shakespeare's *Antony and Cleopatra*.

AHELEN (51° 15' N., 7° 55' E.), town, on Werse, Westphalia, Prussia. Pop. c. 6000.

AHLWARDT, WILHELM (b. 1828), Ger. Oriental scholar; author of books on Arabic poetry.

AHMED I., Sultan of Turkey (1603-17).—**AHMED II.**, Sultan (1691-95).—**AHMED III.**, Sultan (1703-30); wars with Russia, Venice, Austria, and Persia; deposed.

AHMED IBN HAUBAL, see *HAUBAL*.

AHMED SHAH (1724-73), Afghan chief; founder of Durani dynasty; captured Lahore and Naishapur, and made himself master of Kashmir and the Punjab; was possessor of Koh-i-noor diamond.

AHMED VEFIK, Pasha (1819-91), Turk. prime minister and educationalist.

AHMEDABAD, AHMADABAD (23° 5' N., 72° 32' E.), town, Bombay, India; founded, 1411; flourished during Mogul Empire; magnificent Great Mosque and Ivory Mosque and modern Jain temple; silk, gold, and cotton industries. Pop. (1911) 216,000.

AHMEDNAGAR, ADMADNAGAR (19° 7' N., 74° 45' E.), town, Bombay, India; silk and cotton, carpets, metal work. Pop. 43,032.

AHMEDPUR (29° 10' N., 71° 15' E.), town, Bahawalpur State, India. Pop. c. 30,000.

AHN, JOHANN FRANZ (1796-1865), Ger. educationist; improved modern language teaching.

AHR (50° 31' N., 7° 2' E.), river, Germany; joins Rhine.

AHRENS, FRANC. HEINRICH LUDOLF (1809-81), Ger. philologist; wrote studies of Gk. dialects.

AHRIMAN, the Zoroastrian Satan, or evil spirit; opposed to Ormazd (q.v.).

AHRWEILER (50° 33' N., 7° 4' E.), town, Prussia; exports wine. Pop. 5700.

AHUACHAPAN (13° 50' N., 89° 50' W.), town, Salvador, Central America; sugar, coffee. Pop. c. 14,000.

AHWAZ (31° 18' N., 49° E.), village, Persia; ruins of ancient Parthian capital, Artabanus.

AI, HAI, ancient city, Canaan; site unknown; near Bethel.

AIBONITO (18° 7' N., 66° 25' W.), town, Porto Rico; coffee, tobacco.

AICARD, VICTOR FRANÇOIS JEAN (1848-), Fr. poet, novelist, and dramatist; b. Toulon; *Le Père Lebonnard*, 1890; some of his poems crowned by the Academy.

AIDAN, ST. (d. 651 A.D.), came from Iona on Oswald's invitation and became 'Apostle of Northumbria'; founded Lindisfarne monastery.

AIDÉ, CHARLES HAMILTON (1830-1906), Eng. novelist and poet, author of *Eleonore and Other Poems* and *Songs without Music*.

AIDE-DE-CAMP (Fr.), fixed officer on personal staff of commander, also acts as sec.; post of *aide* to king is generally conferred for distinguished military service.

AIDIN (38° N., 28° 30' E.), vilayet (see *SMYRNA*), Asia Minor.—**Aidin** (37° 51' N., 27° 51' E.), town; tanneries.

AIDONE (37° 23' N., 14° 26' E.), town, Sicily. Pop. 3548.

AIDS, sums due by vassals to feudal lords on specified occasions (knighting of e. s., dowering of e. dau., and ransom of lord if captured); grant-in-aid, Parliamentary subsidy to king for special purposes; sheriff's aid, fixed sum paid for his service.

AIGLE (46° 19' N., 6° 58' E.), town, Switzerland; black marble quarries.

AIGRETTE, the tufted plumes of the egret, used as ornaments for head-dresses and the like; the name egret includes the various herons on which such plumes grow in the breeding season.

AIGUES-MORTES (43° 34' N., 4° 11' E.), town in Rhône delta, Gard, France; fine mediæval ramparts; St. Louis sailed for Crusades from A.-M., 1248 and 1270; now several miles from sea; A.-M. means 'dead waters.' Pop. 4500.

AIGUILLON, EMMANUEL ARMAND, DUC D' (1720-82), Fr. statesman; app. Gov. of Brittany, 1753; sometime Minister of Foreign Affairs under Louis XV. in notorious *Triumvirate*; intriguing and incompetent.

AIGUILLON, MARIE MADELINE, DUCHESSE D' (1604-75), niece of Cardinal Richelieu; patroness of Corneille; after retirement from Court devoted to works of charity; assisted St. Vincent de Paul.

AIGUN (50° N., 127° 18' E.), town, China. Pop. c. 20,000.

AIKAWA (38° 5' N., 138° 10' E.), coast town, Sado Island, Japan.

AIKEN (33° 34' N., 81° 40' W.), town, S. Carolina; health resort; cotton mills. Pop. (1910) 3911.

AIKIN, JOHN (1747-1822), Eng. doctor and writer; wrote, with sister, Mrs. Barbauld, *Evenings at Home* (6 vols.); *General Biography* (10 vols.), etc. His dau., Lucy A. (1781-1864), wrote on hist. and literary subjects.

AIKMAN, WILLIAM (1682-1731), Scot. artist; executed portraits of poets, Gay and Thomson; friend of Swift and Pope.

AILANTHUS (tree of heaven), genus of East Indian and Chinese tree of the order *Simarubaceæ*, with large compound leaves and malodorous greenish

flowers. A silk-spinning moth (*Bombyx cynthia*) lives on the leaves.

AILEY, PIERRE D' (1350-1420), Fr. cardinal; legate at Avignon; presided at Council of Constance which condemned Huss.

AILSA CRAIG (55° 15' N., 5° 7' W.), small precipitous island (1114 ft. high), Firth of Clyde, Scotland; lighthouse.

AIMARD, GUSTAVE (1818-83), Fr. novelist; pseudonym of Olivier Gloux; popular stories of adventure of Fenimore Cooper type.

AIN, river, France; rises Jura range; joins Rhône above Lyons.

AIN (46° 7' N., 5° 22' E.), department, France; area, 2248 sq. miles; crossed by river Ain; east, mountainous; west, flat; capital, Bourg; mills, textile and paper manufactures, agricultural exports. Pop. (1911) 342,482.

AIN SEFRA (32° 57' N., 0° 25' W.), province, S. Algeria. Pop. 147,000.

AINGER, CANON ALFRED (1837-1904), Eng. clergyman and author; master of Temple; canon of Bristol; brilliant preacher; distinguished writer on Charles Lamb.

AINMULLER, MAXIMILIAN EMMANUEL (1807-70), Ger. glass-painter and artist; much of his glass-work is in Cologne, Glasgow, and St. Paul's cathedrale.

AINOS, AINU, aborigine race, living in parts of Yezo and Sakhalin, N. Japan; distinct from Japanese whom they probably preceded; short, robust, and hairy; face European rather than Mongolian in type; hunters and fishers; semi-civilised, polygamous; dying out; number 15,000-20,000.

AINSWORTH, HENRY (1571-1622), Nonconformist preacher and student of Hebrew; settled in Amsterdam; annotated Old Testament books.

AINSWORTH, ROBERT (1660-1743), Eng. schoolmaster; author of once famous Latin-English Dictionary (1736).

AINSWORTH, WILLIAM FRANCIS (1807-96), Eng. geologist, geographer, and traveller.

AINSWORTH, WILLIAM HARRISON (1805-82), Eng. novelist; b. Manchester; wrote about forty novels (hist. and antiquarian), which acquired immense vogue and made their author formidable rival to Dickens; little read now; his style is often stilted and artificial.

AINTAB (37° 2' N., 37° 25' E.), town, Aleppo, N. Syria; noted for bazaars. Pop. 45,000.

AIR, see ATMOSPHERE.

AIR, ASSEN (18° 30' N., 9° E.), oasis, Sahara, Fr. Sudan; capital, Agades; caravan centre; dates, millet, indigo; inhabitants of mixed races. Pop. c. 50,000.

AIR, FIXED=Carbon dioxide. See CARBON.

AIRD (7° 35' S., 144° 17' E.), river entering Gulf of Papua, Brit. New Guinea.

AIRD, THOMAS (1802-76), Scottish poet and journalist; poetical work unimportant, but secured him the friendship of Carlyle, De Quincey, Lockhart, Hogg, and others.

AIRDRIE (55° 52' N., 3° 59' W.), municipal burgh, Lanarkshire; collieries, brass and iron works. Pop. 24,388.

AIRE (43° 43' N., 0° 20' W.), cathedral town, Landes, France; Alaric's capital.

AIRE, a Yorkshire river; joins Ouse. Also a tributary of Aisne in France.

AIREDALE (53° 40' N., 1° 50' W.), valley, W. Riding, Yorkshire.

AIR-ENGINE, see ENGINES.

AIRE-SUR-LYS (50° 38' N., 2° 22' E.), fortified town, Pas de Calais, France; breweries. Pop. 8500.

AIREY, RICHARD AIREY, Baron (1803-81), Brit. officer, quartermaster-general under Lord Raglan throughout Crimean campaign; or. peer, 1876.

AIRLIE, 8TH EARL OF, DAVID STANLEY WILLIAM DRUMMOND OGILVY (1856-1900), served in Egypt, 1884-85; killed in Boer War.

AIRLIE, JAMES OGILVY, EARL OF (c. 1593-1648), distinguished leader with Montrose against Covenanters, 1644-45; cr. earl, 1639.

AIRMAN, see AERONAUT.

AIROLA (41° 10' N., 14° 30' E.), village, Benevento, Italy.

AIROLO (46° 32' N., 8° 34' E.), village, canton Ticino, Switzerland; at mouth of St. Gotthard Tunnel.

AIR-SHIP, see FLIGHT, BALLOON.

AIRY, SIR GEORGE BIDDELL (1801-92), Eng. astronomer; brilliant career at Trinity Coll., Cambridge; app. Lucasian prof. of Math's, 1824, and Plumian prof. of Astron., 1825; organised the observatory and created admiration by the punctuality with which his observations were published. He introduced far-reaching improvements in the solar and lunar tables, and after being app. Astronomer-Royal in 1835 he conducted numerous laborious astronomical and meteorological researches that brought him universal recognition. He entirely reorganised the Royal Observatory, Greenwich, and brought it up to an unrivalled standard of usefulness. After resigning in 1881 he still worked, in spite of feebleness, revising previous computations; *Autobiography* (1898).

AISLABIE, JOHN (1670-1742), Eng. politician; member of Privy Council (1716); Chancellor of Exchequer (1718). Supported South Sea Company, for which, on its collapse, he was expelled the House.

AISMUNDERBY (54° 10' N., 1° 30' W.), township, parish of Ripon, W. Riding, Yorkshire.

AISNE (49° 25' N., 3° 30' E.), department, France; area, 2866 sq. miles; mountainous in N.E.; remainder, plains and valleys; agriculture well developed; timber, textile, and iron manufactures; capital, Leon. Pop. (1911) 530,226.

AISNE, river, France; 150 miles long; joins Oise near Compiègne.

AISSE, MILLE (d. 1733), Fr. letter writer; sold as child to Fr. ambassador at Constantinople; of Circassian birth; her romantic history and great beauty brought her considerable fame in Paris; letters edited by Voltaire and others.

AITON, WILLIAM (1731-93), Scot. botanist; (first) director of the botanical gardens at Kew, from 1759 to his death.

AITUTAKI (19° 55' S., 159° 20' W.), one of Cook Islands, belonging to New Zealand. Pop. 1200.

AITZEMA, LIEUWE VAN (1600-69), Dutch historian; wrote *History of Netherlands* (from 1621-68).

AIVALIK (39° 18' N., 26° 45' E.), seaport, Asia Minor; exports fish. Pop. c. 30,000.

AIVAZOVSKI, IVAN (1817-1900), Russ. marine painter.

AIX, AIX-EN-PROVENCE (43° 31' N., 5° 27' E.), cathedral town, S.E. France; ancient capital of Provence; famous mediæval univ.; founded by Romans, 123 B.C.; Marius defeated Teutons, 102 B.C.; thermal springs; trades in olive oil. Pop. 19,433.

AIX (45° 55' N., 1° 10' W.), small island, France; near mouth of Charente.

AIX, genus of fresh-water ducks including N. Amer. wood duck and Chinese mandarin duck.

AIX-LA-CHAPELLE, see AACHEN.

AIX-LES-BAINS (45° 51' N., 5° 55' E.), town, Savoy, France; near Lake Bourget; favourite health resort; hot springs. Pop. 4741.

AJACCIO (41° 55' N., 8° 44' E.), capital of Corsica, lying on Gulf of A.; classical *Adjacium*; seat of ancient bishopric; birthplace of Napoleon; exports wood, charcoal, wine, fruit, coral, sardines, chiefly to France. Pop. 21,779.

AJAGARE (24° 50' N., 80° 20' E.), native state, India; principal town, Nausahr. Pop. 78,000.

AJALON (31° 51' N., 35° 3' E.), town, ancient Palestine (see *Joshua* 10); modern Yalo.

AJANTA (20° 32' N., 75° 48' E.), village, Nizam's Dominions, India; famous caves, dwellings, and meeting halls, used by Buddhists; earliest date from 200 B.C.

AJAX (1) *the Great*; s. of Telamon, king of Salamis; after Achilles, principal hero of Trojan War; contended with Ulysses for Achilles' arms, and on failure went mad and committed suicide; subject of tragedy by Sophocles. (2) *The Less*; s. of Oileus, king of Locris; renowned for swiftness of foot; wrecked and drowned on way home, because of outrage on Cassandra.

AJMERE, **AJMER** (26° 31' N., 74° 35' E.), town, Rajputana, India, on Taragarh Hill; famous Muhammadan tomb and old Jain temple, part used as mosque; trades in salt, oil, opium. Pop. (1911) 86,000.

AJMERE-MERWARA (26° 10' N., 74° 40' E.), province, India; capital, Ajmere; area, 2710 sq. miles; cotton, wheat, oil-seeds. Pop. (1911) 501,000.

AJODHYA (26° 48' N., 82° 12' E.), ancient town, on Gogra, Oudh, India; once great religious centre; now ruined; Jain temples and fair attract annually 500,000 pilgrims; modern town on site. Pop. 8000.

AJURUOCA (22° 20' S., 42° 25' W.), town, Minas Geraes, Brazil; tobacco, sugar-cane.

AKA HILLS (27° 10' N., 93° E.), district, N. India, inhabited by Akas.

AKABA, **GULF OF** (28° 40' N., 35° E.), eastern arm of Red Sea.—**Akaba** (29° 30' N., 35° 20' E.), town, near head of gulf.

AKALKOT (17° 18' N., 75° 58' E.), native state, India. Pop. 82,047.—**Akalkot** (17° 31' N., 76° 15' E.), town. Pop. 8348.

AKASHI (34° 40' N., 134° 56' E.), summer resort, Hondo Island, Japan; meridian regulates Japanese time.

AKASSA (4° 15' N., 6° 15' E.), transshipment station, mouth of Nun, S. Nigeria.

AKBAR, **THE GREAT**, **JELLALADIN MUHAMMAD** (1542-1606), Mogul Emperor of India; succ., 1556; a great conqueror and most enlightened ruler; extended dominion over N. India; generous patron of lit.; promoted education of both Muslims and Hindus; his minister, Abul Fazl, wrote a valuable record of A.'s reign.

AKCHA (37° N., 66° 15' E.), town, Turkestan. Pop. c. 8000.

A KEMPIS, **THOMAS**, see **KEMPIS**.

AKEN (51° 51' N., 12° 2' E.), town, Germany; cloth and chemical manufactures. Pop. 7358.

AKENSIDE, **MARK** (1721-70), Eng. poet and physician; studied theol. and med. at Edinburgh; chief poetical work, *Pleasures of the Imagination*, in blank verse (1744); stilted, little originality; in later life successful physician; pedantic doctor in Smollett's *Peregrine Pickle*.

AKERSHUS, **AGGERSHUS** (59° 55' N., 11° 5' E.), old fortress and county, Norway, around Christiania.

AKHAL-TEKKE (39° N., 58° E.), oasis in Russ. Transcaspiia; cereals, fruit trees.

AKHALTSIKEH (41° 40' N., 43° 1' E.), town, Transcaspiia; noted for silver filigree. Pop. 15,387.

AK-HISSAR (38° 54' N., 27° 50' E.), town, Smyrna. Pop. c. 20,000.

AKHLAT, **KHLAT** (38° 47' N., 42° 13' E.), small town, Asiatic Turkey; see of Armenian bp.

AKHMIM (26° 32' N., 31° 49' E.), town, Upper Egypt; textiles. Pop. c. 25,000.

AKHTYRKA (50° 18' N., 34° 56' E.), cathedral town, Russia. Pop. 25,965.

AKIBA, **BEN JOSEPH** (fl. II. cent.), Jewish rabbi, authority on Jewish tradition; flayed by Romans for part in a revolt of 135.

AKITA (39° 35' N., 139° 55' E.), town, Hondo I., Japan; silk, rice.

AKKA, race of African pygmies dwelling in Congo forest, rarely 4 feet in height; live chiefly by hunting, but collect ivory and prepare poisons which they exchange for grain and manufactured goods.

AKKAD, **ACCAD**, one of the cities which constituted

Nimrod's kingdom of Shinar.—**Akkadian**, **ACCADIAN**, inhabitant of Akkad; language of such people.

AKKERMAN (46° 20' N., 30° 20' E.), town on Black Sea, Russia. Pop. 32,470.

AKMOLINSK (50° 5' N., 70° E.), province and town, Siberia, Russia. Pop. of province (1910), c. 1,047,000.

AKOLA (20° 41' N., 76° 50' E.), town, Berar, India. Pop. 30,000; district pop. 755,000.

AKOT (21° 6' N., 77° 6' E.), town, N. Akola, India; cotton.

AKRA, see **ACCRA**.

AKRON (41° 6' N., 81° 31' W.), town, Ohio; manufacturing and traffic centre. Pop. (1910) 69,070.

AKSAKOV, **IVAN SERGEIVITCH** (1823-86), Russ. writer and advocate of Panславism.

AK-SHEHR (38° 25' N., 31° 25' E.), town, Asia Minor.

AKSU (41° 7' N., 79° 7' E.), town, Chinese Turkestan; caravan centre.

AKUREYRI (65° 40' N., 18° W.), trading town, Iceland coast.

AKYAB (20° 10' N., 93° E.), seaport, Burma, in A. district; exports rice, oil. Pop. 31,687; district, 482,000.

ALABAMA (30° 13' to 35° N., 84° 51' to 88° 31' W.), state, U.S.A.; bounded by Tennessee on N., Georgia on E., Florida and Gulf of Mexico on S., Mississippi on W.; area, 52,250 sq. miles; surface flat, except in N.E., where are Appalachian mountains; chief rivers, Alabama, Mobile, Tennessee. A. has temperate climate; soil of coastal plain sandy; further N. rich black soil gives name to 'Black Prairie,' where cotton is grown; N. again are mineral and cereal-producing regions. A. was originally inhabited by Indians; French made first settlement, 1702, at Mobile; at end of Fr. occupation, 1763, northern part was joined to Illinois; southern part to W. Florida, was held for time by Spaniards; portions subsequently claimed by Georgia and other states; Ind. risings suppressed by Jackson, 1813; territory organised, 1817; admitted to Union, 1819; one of first states to secede from Union, 1861; Mobile and Selma captured by Federalists, 1865; after war, state convention revoked secession ordinance, abolished slavery; re-admitted to Union, 1868; Democratic party has been in power since 1874.

GOVERNMENT.—Senate and House of Representatives; offices of state held four years; gov. has full power, but his veto can be overruled by majority vote; State represented by 10 members in Congress.

EDUCATION.—School system for whole state introduced, 1854; separate schools for whites and blacks established, 1875; schools kept up by taxation; State Univ. and Southern Univ. (Greensboro); Tuskegee Institute (for negroes), various colleges, normal schools, etc.

Chief industry is agriculture; large quantities of cotton, Indian corn, and other cereals produced; tobacco and sugar; chief minerals, iron and coal, of which rich deposits exist; gold, silver, lead, etc., also found; produces timber; iron and steel manufactures, cotton mills, coke and turpentine factories; chief towns, Montgomery (capital), Mobile, Birmingham. Pop. (1910) 2,138,093.

Pickett, *History of A.* (1900).

ALABAMA (31° 50' N., 87° 30' W.), river, A., U.S.A.; joins Tombigbee, forming Mobile and Tensas Rivers.

'ALABAMA' CASE.—*Alabama* was Confederate boat, built in Birkenhead, which in Amer. Civil War captured many Federal vessels, injuring shipping trade of America; Union claimed damages from Britain for breach of neutrality in allowing Confederate boats to be built and fitted out in Britain, and to use Brit. colonial ports; international tribunal of five arbitrators, app. respectively by U.S.A., Britain, Italy, Switzerland, and Brazil, met at Geneva, 1872; awarded indemnity of \$15,500,000.

ALABASTER, name applied to two species of mineral extensively used as a white translucent decorative stone in arch., and for figures, vases, etc. The ancients employed a carbonate of lime deposited from calcareous water for sarcophagi, jars, perfume vases, etc. It is worked chiefly in Egypt and Mexico. At the present day the term is used for a fine-grained variety of gypsum, out of which are carved the figures, clocks, vases, and divers ornaments which are a characteristic feature of the shops in Florence, Pisa, and other Tuscan towns.

ALACOQUE, MARIE (1847-90), Fr. nun and mystic; founded the popular devotion to the Sacred Heart; beatified, 1884.

ALADDIN, character in *Arabian Nights*, who became possessed of lamp and ring by rubbing which two genii were summoned to do his will.

ALAGOAS (9° 30' S., 36° 30' W.), state, Brazil. Pop. 800,000.

ALAGOINHAS (12° 10' S., 38° 20' W.), small town, Bahia, Brazil.

ALAGON (41° 45' N., 1° 9' W.), town, Saragossa, Spain. Pop. c. 5000.

ALAGOZ, ALAGHES (40° 28' N., 44° 15' E.), mountains, Transcaucasia; volcanic origin.

ALAI MOUNTAINS (39° 55' N., 72° E.), lofty mts., Central Asia; extension of Tian-Shan mts.

ALAIN DE LILLE, ALANUS AB INSULIS (1114-1202), Fr. theologian, poet, and scholar, called *Doctor Universalis*; wrote Latin satire on vice, and treatise on morals.

ALAIS (44° 6' N., 4° 4' E.), town, Gard, France; glass, coal, and iron. Pop. 25,000.

ALAIS, PEACE OF, treaty (1629) by which Richelieu ended Huguenot wars.

ALAJUELA (9° 58' N., 84° 18' W.), province and small town, Costa Rica. Pop. (province) 90,000.

ALA-KUL (46° 21' N., 81° 27' E.), lake, Russ. Turkestan.

ALAMANNI, see **ALEMANNI**.

ALAMANNI, LUIGI (1495-1556), Ital. poet and statesman; served Francis I. and Henry II. of France as ambassador; wrote several plays and much verse.

ALAMEDA (37° 40' N., 122° 13' W.), town, California. Pop. (1910) 23,883.

ALAMOS (27° 10' N., 109° 5' W.), town, Sonora, Mexico; gold and silver mines.

ALAND ISLANDS (60° 10' N., 20° E.), about 300 islands, Gulf of Bothnia; 80 inhabited; taken from Sweden by Russia, 1809; cereals, cattle. Pop. c. 19,000.

ALANI, nomadic tribe from Caucasus; invaded Europe IV. and V. cents.

ALAOIRA (17° 30' S., 49° E.), large but diminish ing lake, Madagascar.

ALAPAYEVSK (58° N., 61° 50' E.), town, on Neiva, Perm, Russia; ironworks.

ALARCÓN, HERNANDO DE (XVI. cent.), Span. navigator; explored coast of California (1510) and constructed correct map of same.

ALARCÓN, PEDRO ANTONIO DE (1833-91), Span. author; journalist in early life; wrote account of his adventures in Moroccan War, which secured wide circulation, several popular novels, and poems.

ALARCÓN Y MENDOZA, JUAN RUIZ DE (d. 1639), Span. dramatist; b. Mexico; wrote many plays, including *La Verdad Sospechosa* (imitated in Corneille's *Le Menteur*) and *El Tejedor de Segovia*; depreciated by contemporaries, but now recognised as one of greatest Span. dramatists.

ALARIC (d. 410 A.D.), king of the Visigoths b. near the Danube; made his first appearance a. general under Emperor Theodosius in war with Eugenius. After Theodosius' death A. was proclaimed king of the Goths, and his life thereafter is one long chapter of conquests; ravaged Greece, invaded Italy, besieged, captured, and pillaged (410) Rome, the mistress of the world; d. shortly afterwards at Coesenza.

ALARIC II. (d. 507), king of Visigoths; slain in war with Clovis, the Frankish king.

ALARODIAN LANGUAGES, name sometimes given to Georgian and kindred tongues.

ALA-SHAN, LITTLE Gobi (43° N., 105° E.), sandy desert, S. Mongolia; only inhabitants, Togod Mongols.

ALA-SHEER (38° 22' N., 28° 32' E.), town, Asia Minor. Pop. 22,000.

ALASKA (54° 40' to 71° 30' N., 141° to 168° W.), peninsula, N. America, territory of U.S.A.; bounded by Arctic Ocean on N., Arctic Ocean and Bering Strait on W., Pacific on S., Canada on E.; area c. 590,884 sq. miles; traversed by many mountain ranges. Aleutian range near coast and Alaskan mountains farther inland, of which principal peaks are Mts. McKinley and Foraker, have many active volcanoes; hot springs found in district; Coast range crosses south-eastern district; Rockies extend from Yukon to north-east of Alaska. Coast is much indented; chief islands: Aleutian and Kodiak Islands in S.W., Alexander Archipelago in S.E.; first and third are remains of submerged mountain ranges; principal river, Yukon; large forests. Climate is damp and very severe; fauna includes moose, caribou, sables, otters, seals, wolves, bears, beaver, ermine, foxes, minks; flora includes balsam, fir, cedars, hemlock, spruce.

HISTORY.—Region was discovered by Russ. officer, Vitus Bering, 1728; explored by him and Chirikov, 1741; traders followed, and in 1763 Kodiak was discovered; Russians cruelly abused natives. Captain Cook made survey, 1778; Vancouver surveyed S.E. coast, 1793-94; Russo-Amer. company formed to regulate affairs, 1799; Sholikhof company also established, early administrator of which, Baranov, founded Sitka; treaties with U.S., 1824, Britain 1825, fixed Russ. boundaries; territory sold by Russia to U.S., 1867, for \$1,440,000; boundary dispute settled, 1903.

GOVERNMENT.—Governed by U.S. officials; administration exercised by resident gov., surveyor gen., and others; sends delegate to Congress, since 1906.

Principal industries are fisheries, fish-packing; produces furs; principal minerals, gold and lignite; great gold district at Klondike (q.v.); silver, platinum, copper also found. Communications greatly developed since 1896; larger towns all in telegraphic communication with States, mails regularly delivered; one railway crosses interior, and others have been planned; good supply of schools. Pop. (1910) 64,356. Principal towns, Nome, Juneau (capital), Skagway, Sitka. Higginson, *Alaska* (1909).

ALASSIO (44° N., 8° 11' E.), town, Italy. Pop. 5030.

ALASTOR, an avenging spirit.

ALA-TAU, six mountain chains, Russia in Asia.

ALATRI (41° 44' N., 13° 21' E.), manufacturing town, S. of Rome, Italy; remains of Cyclopean walls. Pop. 18,000.

ALATYR (54° 52' N., 46° 32' E.), town, Simbirsk, Russia; grain.

ALAUDA, genus of song-birds including lark (q.v.).

ALAVA (42° 50' N., 2° 40' W.), province, Spain; cereals, timber, salt; capital, Vitoria. Pop. (1910) 98,500.

ÁLAVA, DON MIGUEL RICARDO DE (1770-1843), Span. general and ambassador; serving first in navy, was present at Trafalgar; later, one of Wellington's aides-de-camp at Waterloo, and gazetted brigadier-general.

ALB (Lat. *albus*, white), ecclesiastical vestment, reaching to feet, worn specially at celebrations of Eucharist; generally of white linen, and in Middle Ages often embroidered, but now in Rom. Church generally plain (except in religious orders); revived in England by ritual movement, and worn under chasuble by celebrating priest, and sometimes by lay servers.

ALBA (44° 43' N., 8° 5' E.), town, Italy. Pop. 13,900.

ALBA FUCENS (42° 8' N., 13° 22' E.), ancient town, Italy; belonged originally to Acqui; taken by Romans, 304 B.C.; fortifications remain.

ALBA LONGA (41° 43' N., 12° 40' E.), ancient Latin town, on shore of Albanus Lacus, near Rome; traces of neropolis remain.

ALBACETE (38° 52' N., 1° 50' W.), province, Spain; cereals, fruits, wine; sulphur springs. Pop. (1910) 259,000.

ALBACETE (38° 59' N., 1° 50' W.), capital, A., Spain. Pop. 21,512.

ALBACORE, large fish of mackerel (*q.v.*) family; also the tunny (*q.v.*).

ALBAN, ST. (III. cent.), first Brit. martyr; b. at Verulam; put to death during persecution of Christians by Diocletian; church built on scene of his martyrdom by Offa of Mercia, from which the abbey and town of St. Albans arose.

ALBANI, famous Roman family, members of which attained highest dignities in Church, one being Clement XI.

ALBANI, FRANCESCO (1578–1660), Ital. artist; b. Bologna; pupil of Caracci; graceful paintings; mythological and idyllic subjects; 'Anacreon of painting.'

ALBANI, MADAME, *née* MARIE EMMA LA JEUNESSE (1847–), Canadian vocalist, of Fr. descent; one of leading operatic and oratorio sopranos.

ALBANIA (41° 30' N., 47° 30' E.), district, Caucasus; invaded successively by Alani, Khazars, Huns, Parangians, Mongols.

ALBANIA (40° 45' N., 20° 14' E.), district in W. of European Turkey; borders on Adriatic and Ionian Seas, whence it stretches eastward to Shar Dagh mountains; extends between Montenegro and Greece. A. comprises vilayets of Scutari and Janina and part of Monastir and Kossovo; area, c. 20,000 sq. miles. Surface generally consists of high plains and mountain ridges which trend N.W. and S.E.; drained by Drin, Vjosë, Boyana, and other rivers. Chief lakes are Scutari, Janina, Okhrida. Chief towns are Scutari, Prizren, Janina. Climate is healthy.

Ancient Illyria and Epirus, now included in A., were provinces of Byzantine Empire and were frequently ravaged by barbarians. Bulgarians established kingdom in S. in IX. cent., which long resisted emperors of Constantinople. Early in XV. cent., when Turk. aggression began, Albanians offered stout resistance, and under great leader Skanderbeg defeated Turk. armies on many occasions. In 1477 Muhammad II. began siege of Scutari, which fell after fifteen months, when treaty was concluded whereby Turk. authority was recognised. Till 1770 history was one of ceaseless warfare, both internal and against Montenegrins. A. took no part in Russo-Turkish War of 1877–78, nor in Gk. War of Independence. Revolts against Turkey continually took place.

Inhabitants include Turks, Serbs, Rumanians, Greeks, besides Albanians themselves, who are warlike race descended from ancient Illyrians; they have retained their own language, of which there are two principal dialects, Gheg in N. and Tosk in S. Intertribal struggles are continually going on, robbery and brigandage are common, and vendetta is established custom. Chief religion is Muhammadanism, but there are numbers belonging to Gk. and R.C. Churches. Resources include forests of oak, beech, ash, and other trees; maize, wheat, rice, tobacco, olives, oranges, vines, and mulberries are cultivated; cattle raised; exports fish, salt, cattle, agricultural produce, silk, olive oil, tobacco, sugar, coffee, skins, etc. Pop. c. 1,500,000.

With invasion of A. by Montenegro and Serbia in 1912 the question of A.'s future came into prominence. Serbia, desiring an outlet on the sea, naturally wished to retain the ports she had taken; her claims were covertly supported by Russia, while Austria and Italy demanded autonomy for the original A. See TURKO-BALKAN WAR.

Durham, *High A.* (1909); Galanti, *L'Albania* (1901).

ALBANO (41° 44' N., 12° 39' E.), summer resort, Via Appia; site of Pompey's villa.

ALBANUS LACUS (41° 43' N., 12° 41' E.), lake near Rome.

ALBANUS MONS (41° 42' N., 12° 41' E.), hill, near Rome.

ALBANY (42° 40' N., 73° 45' W.), town, New York; fine examples of Dutch arch.; public buildings include State Capitol, white marble structure, many halls, banks, etc.; R.C. and Prot. cathedrals, medical and other colleges, hospitals; one of earliest settlements in Union; French established trading post, c. 1540; Dutch emigrants settled here early XVII. cent., Eng. settlers, XVIII. cent.; capital, New York State, since 1797; railway and trading centre; manufactures iron and brass goods, beer, cigars, aniline dyes, etc. Pop. (1910) 100,253.

ALBANY (51° 30' N., 83° W.), river, Canada; flows into James Bay.

ALBANY (31° 35' N., 84° 10' W.), town, Georgia. Pop. (1910) 8190.

ALBANY (35° S., 117° 50' E.), seaport, W. Australia. Pop. 3650.

ALBANY (33° 20' S., 28° 30' E.), district, Cape Province, S. Africa. Pop. (1911) 32,000 (11,000 white).

ALBANY (Celtic form of Albion), old name for Scot. Highlands.

ALBANY, DUKEDOM OF.—King Robert of Scotland, in 1398, created his 2nd s., Robert Stuart, 1st Duke of A. He was succ. by his s. Murdoch, executed 1425, and the dukedom became extinct. It was revived by James II. and conferred on his s. Alexander, who transmitted it to his s. John, Regent of Scotland (1515–23). Having again become extinct, it was revived (1565) in favour of Lord Darnley, Queen Mary's husband, and in infancy was conferred both on Charles I. and James II. (of England). Later, in conjunction with other titles, it was granted to Ernest Augustus, bro. of George I.; Edward Augustus, bro. of George III.; Frederick, 2nd s. of George III.; and to Prince Leopold, 4th s. of Queen Victoria; present Duke: Charles Edward, Duke of Saxe-Coburg-Gotha, b. and succ. 1884.

ALBANY, LOUISE, COUNTESS OF (1752–1824), dau. of Prince Gustavus Adolphus of Stolberg-Gedern; m. (1772) Charles Edward Stuart ('Young Pretender'), who dubbed himself Count of A. The Prince's violence and drunkenness compelled her to seek flight, and she lived for many years with the Ital. poet Vittorio Alfieri (*q.v.*); see Vernon Lee, *Countess of Albany*.

ALBATEGNIUS (c. 850–930), Muhammad ibn-gibir al Batani, the foremost Arab astronomer; compiled exact tables of the planets and introduced sines into trigonometrical calculations.

ALBATROSS (*Diomedea*), genus of large sea-birds of the order Tubinares, related to the petrels, occurring in the Southern Ocean. The common s. (*D. exulans*) measures from 10 to 15 ft. between tips of extended wings; one of the most indefatigable flyers known; according to superstition it is unlucky to shoot an s. (cf. *The Ancient Mariner*).

ALBAY (13° 5' N., 123° 40' E.), town, Philippines. Pop. 41,950.

ALBEDO, degree of light reflected from a rough surface, e.g. sunlight from the moon.

ALBEMARLE, DUKEDOM AND EARLDOM OF (Fr. Aumale), title first conferred upon Odo of Champagne, bro.-in-law of William the Conqueror, and with it the isle of Holderness, Yorkshire. Having become extinct, it was revived again, as an earldom, in favour of Richard Beauchamp, Earl of Warwick (1423); raised to a dukedom, it was conferred upon General Monk by Charles II. William III. bestowed it as an earldom on Arnold Joost van Keppel, by whose descendants it is still held.

ALBEMARLE, GEORGE MONCK, DUKE OF (1608–70), Eng. general; captured by Fairfax at

Nantwich, and imprisoned, 1644-46; entered Commonwealth service for Irish wars; commanded infantry brigade at Dunbar, 1650; commander-in-chief in Scotland after Cromwell's departure, and achieved its conquest; one of three generals of the fleet, 1652-53, and defeated Dutch; kept order in Scotland, 1654-59; remained faithful to Cromwell and, until he 'forsook himself,' to his son; peacefulness of Restoration due to his firmness.

Life, by Guizot (1851), Corbett (1889).

ALBENDORF (50° 26' N., 16° 39' E.), small town, Silesia, Prussia.

ALBENGA (44° 4' N., 8° 14' E.), town, Italy. Pop. 6248.

ALBERICH, legendary king of dwarfs and head of Nibelungs (*q.v.*).

ALBERONI, GIULIO (1664-1752), Span. cardinal (1717); s. of a gardener; rose to high position in Church and State; Philip V.'s chief minister; sought to revive Spain's power; dismissed (1719) after failure of foreign policy, owing to quadruple alliance (England, France, Austria, Holland).

ALBERT.—(1) (45° 50' N., 64° 50' W.) Town and county, New Brunswick, Canada. (2) (30° S., 27° E.) Division, Cape Province, S. Africa. (3) (50° 20' N., 2° 37' E.) Small town (formerly Anore), Somme, France. (4) (17° 38' S., 139° 53' E.) River, Queensland, enters Gulf of Carpentaria.

ALBERT (1490-1545), Elector of Mainz; abp. of Magdeburg; s. of Elector of Brandenburg; strenuous efforts were made to secure his help for the reformed faith, but he definitely ranged himself on the side of Catholicism; granted power to sell indulgences by Leo X.; generous patron of learning; friend of Erasmus.

ALBERT (1490-1568), last Grand Master of Teutonic Order; 1st Duke of Prussia; very friendly towards Luther, and did much to further his doctrines.

ALBERT, ALCIBIADES (1522-57), Margrave of Brandenburg, Prince of Bayreuth; joined Emperor Charles V. against France (1543); later served under Maurice of Saxony; ravaged Franconia; d. under the Imperial ban.

ALBERT I. (1875-), King of Belgium; succ. his uncle, Leopold II., 1909.

ALBERT I., THE BEAR (1100-70), Margrave of Brandenburg; conducted campaigns against the Wends; did much to further Christianity and civilisation.

ALBERT III. (1414-86), Elector of Brandenburg; succ. on abdication of bro., Frederick II.; by his energy and ambition made himself one of most powerful princes of his time; called the Ger. Achilles or Ulysses.

ALBERT I. (1250-1308), Ger. king (1298); s. of Rudolph I. of Hapsburg; murdered by his nephew, John, whom he had disinherited.

ALBERT II. (1397-1439), Ger. king (1438); Albert V., Duke of Austria; king of Bohemia and Hungary; fought with King Sigismund against Hussites.

ALBERT III. (1443-1500), Duke of Saxony; in campaign against Charles the Bold, Duke of Burgundy (1475); famous for strength and feats of arms; founded royal House of Saxony.

ALBERT, FRANCIS CHARLES AUGUSTUS (1819-61), Prince Consort of Britain; s. of Duke of Saxe-Coburg-Gotha; m. Queen Victoria, Feb. 10, 1840. The title of Consort was conferred in 1842; that of Prince Consort in 1857. He d. of typhoid fever at Windsor, Dec. 14, 1861. Of a handsome person, possessed of great tact, the Prince Consort by the purity and usefulness of his life endeared himself to all classes.

Life, by Sir Theodore Martin, 1874-80.

ALBERT, FREDERICK AUGUSTUS (1828-1902), king of Saxony; succ. 1873; at age of twenty-one was engaged in campaign of Schleswig-Holstein

against the Danes, and took prominent part in later wars of period.

ALBERT, FRIEDRICH RUDOLF (1817-95), Archduke of Austria; field-marshal; s. of Archduke Charles; bred to arms from his early years, he took a prominent part in Italian Wars (1848-70), and won reputation as a brilliant general.

ALBERT, ST., bp. of Liège; assassinated at Henry VI.'s instigation, 1195.

ALBERT, THE PIOUS (1559-1621), archduke of Austria; cardinal, abp. of Toledo, Viceroy of Portugal, and Stadtholder of Netherlands.

ALBERTA (52° 40' N., 114° 20' W.), was one of N.W. territories of Canada until 1905, when it became separate province; area, 251,180 sq. miles; surface generally level in N. and S.E., mountainous in W., which is occupied by Rockies (*q.v.*); much of S. is prairie land; watered by Smoky, Peace, Athabasca, Saskatchewan, and other streams; chief towns, Edmonton, Calgary; climate healthy; administered by lieut.-gov.; has separate Parliament of one chamber with 41 members.

In N. are forests; S.W. is important ranching district, raising great numbers of cattle, horses, and sheep; dairying carried on. Fish abound in rivers and lakes, and game is plentiful. Wheat and other grains cultivated; fruits and tobacco grown. Minerals include coal, lignite, petroleum, iron, gold, silver, copper; at Banff, which is part of Canadian National Park, there are hot sulphur springs. A. is crossed by Canadian Pacific main and branch lines. Pop. (1911) 375,000.

Thwaite, *Alberta* (1912).

ALBERT EDWARD NYANZA (0° 20' S., 29° 45' E.), lake, upper Nile basin, in Belgian Congo; greatest length, 44 miles; breadth, 32 miles; discovered by Stanley, 1889.

ALBERT LEA (43° 37' N., 93° 20' W.), town, Minnesota. Pop. (1910) 6192.

ALBERT NYANZA (1° 30' N., 31° E.), lake, Nile basin, British Uganda; greatest length, c. 100 miles; width, over 20 miles; receives Semliki River from Albert Edward Nyanza at S.W. end; northern outlet, White Nile; first discovered by Sir Samuel Baker, 1864; circumnavigated by Gessi Pasha, 1876, Emin Pasha, 1884.

ALBERTI, LEONE BATTISTA (1404-72), Ital. architect and scholar; wrote works on sculpture and painting.

ALBERTITE, variety of asphalt found in the county of Albert, New Brunswick.

ALBERTUS MAGNUS (c. 1206-80), theologian, teacher of Thomas Aquinas; one of most learned men of his time, student of Aristotle, and of natural science; wrote commentaries on Peter Lombard and Aquinas, and much else; studied by Dante.

ALBERTVILLE (45° 42' N., 6° 21' E.), town, Savoie, France; silver-lead mines.

ALBERTVILLE (6° 4' S., 29° E.), settlement, Belgian Congo, W. of Tanganyika.

ALBERUS, ERASMUS (1500-53), Ger. theologian; one of Luther's most active supporters.

ALBI (43° 55' N., 2° 8' E.), town, France; cathedral and abp.'s palace. Pop. 15,000.

ALBIAN, the lowest stage of the Upper Cretaceous rocks, including Upper Greensand and Gault in England; continental geologists use the term for the youngest stage of the Lower Cretaceous. It is well developed in the Department of Aube (France), corresponding formations being Flammenmergel (Germany), Fredericksburg beds (N. America), and Upper Sandstones of Nubia. See CRETACEOUS.

ALBIGENSES, name applied about 1200 to religious sect of southern France, offshoot of a movement in both Eastern and Western Christendom. Their exact beliefs are uncertain, but they certainly disbelieved in the sacramental system of Catholicism and protested against clerical abuses. Many were Catharists. St. Bernard and St. Dominic tried to

0° 18' E.). Pop. 6293.—**Alcala la Real** (37° 28' N., 3° 55' W.). Alfonso XI. captured fortress from Moors; hence name, the 'Royal Castle.' Pop. 15,973.—**Alcala del Rio** (37° 30' N., 5° 57' W.), or **Guadalquivir**. Pop. 3006.—**Alcala de la Selva**, in Teruel. Pop. 1490.—**Alcala de la Vega**, in Cuenca. Pop. 712.—**Alcala de Gurrea**, in Huesca. Pop. 632.—**Alcala del Obispo**, in Huesca. Pop. 432.—**Alcala del Ebro**, in Saragossa. Pop. 388.—**Alcala de Moncayo**, in Saragossa. Pop. 367.

ALCAMO (37° 59' N., 12° 56' E.), town, Sicily. Pop. (1911) 51,798.

ALCANIZ (41° 1' N., 0° 7' W.), walled town, Teruel, Spain.

ALCANTARA (39° 43' N., 6° 52' W.), town, Spain; has Rom. bridge.—**Order of A.** (religious and military), established 1156, for defence against Moors; several times suppressed and revived. (2) (2° 20' S., 44° 20' W.), seaport, Brazil.

ALCARAZ (38° 40' N., 2° 35' W.), range of mountains, Spain; loftiest peak, *Sierre de A.* (5900 ft.).

ALCARRIA, LA (40° 50' N., 2° 30' W.), fertile tract of land, Guadalajara, Spain.

ALCAUDETE (37° 37' N., 4° 10' W.), town, Jaen, Spain; dried fruits.

ALCAVALA, extortionate tax imposed in Spain, up to period of Napoleon's invasion, upon all raw or manufactured goods, amounting to 14 % on market price, and operative each time the property changed hands.

ALCAZAR, name of Moorish palaces in Spain.

ALCAZAR DESAN JUAN (30° 23' N., 3° 11' W.), town, Spain; soap manufactures. Pop. 11,499.

ALCEDO, the kingfisher (*q.v.*).

ALCESTER (52° 13' N., 1° 51' W.), town, Warwickshire; site of Rom. camp. Pop. (1911) 7314.

ALCESTER, FREDERICK BEAUCHAMP PAGET SEYMOUR, Baron (1821-95), Eng. admiral; commander at bombardment of Alexandria, for which service was raised to peerage; died unmarried, and title became extinct.

ALCESTIS, **ALCESTE** (classical myth.), wife of Admetus, who gave herself up to death to save husband; brought back from lower world by Hercules; subject of tragedy by Euripides (*q.v.*).

ALCHEMY was the forerunner of chemistry, much in the same way as astrology preceded astronomy. The alchemists undertook the quest for the 'philosopher's stone' with which they hoped to convert the baser metals into gold and silver, the 'alkahest' or universal solvent, and the 'elixir vitae' by which life might be prolonged. The 'magisterium' was sought for after the action of various drugs had been investigated, and was supposed to cure all diseases. A. flourished in the Middle Ages, and, based on the work of Hermes Trismegistus and Geber, was eagerly pursued by Albertus Magnus, Lully, Roger Bacon, Paracelsus, and many others; and modern chem. is indebted to them for many discoveries and ideas. Perhaps the recent researches in radioactivity and the growing conviction of the unity of matter will, in a sense, make some of the dreams of the alchemists come true.

ALCIBIADES (c. 450-404 B.C.), Athenian statesman and general; most brilliant figure of age of Pericles, whose nephew he was; of high birth, great wealth, every personal and mental distinction. A. led anti-Lacedæmonian party; commanded expedition against Sicily; recalled and impeached for alleged mutilation of statues of Hermes; fled to Sparta and proved dangerous enemy to Athens; Spartans became jealous; fled to Persian satrap Tissaphernes; later won great victories over both Persians and Spartans; captured Cyzicus, Chalcedon, and Byzantium for Athens; invited to return, 407, but speedily superseded; murdered in Phrygia.

ALCIDES (classical myth.), descendant of Alcæus; designation of Hercules.

ALCINDUS, AL-KINDI (fl. IX. cent.), Arab. phil-

osopher; commentator on Aristotle; reputed founder of Arab. philosophy.

ALCINOUS (classical myth.), king of Phæacians; f. of Nausicaa; host of shipwrecked Odysseus.

ALCIPHON (II. cent. B.C.), Gk. rhetorician and brilliant epistle writer.

ALCIRA (39° 8' N., 0° 20' W.), town, Spain; produces silk. Pop. 20,572.

ALCMEON (Gk. myth.).—(1) Went mad after murdering his mother, Eriphyle (*q.v.*); killed in attempting to secure fatal necklace of Harmonia for his second wife, Callirrhoe. (2) Son of Syllus, grandson of Nestor; who left Messenia when the Heraclids conquered Peloponnesus, and founded at Athens the **Alcmeonidae**, a family who were prominent at time of Peloponnesian War, of which Pericles and Alcibiades were members.

ALCMEON (VI. cent. B.C.), Gk. philosopher, anatomist, and physiologist.

ALCMAN, ALCMEON (8. VII. cent. B.C.), Gk. poet; Lydian slave; enfranchised and lived at Sparta; fragments of lyrics alone remain; first poet, it is said, to sing of love; inventor of choral ode; hence term **Alcmanian**, applied in Greece to lyric verse.

ALCMENA (classical myth.), wife of Amphitryon and mother by Zeus of Hercules.

ALCOBAÇA (39° 32' N., 8° 58' W.), town, Portugal; famous old Cistercian convent.

ALCOCK, JOHN (d. 1500), Eng. scholar; dean of Westminster (1461); ambassador to Castile (1470); and successively bp. of Rochester, Worcester, and Ely; twice Lord Chancellor; founder of Jesus College, Cambridge.

ALCOCK, SIR RUTHERFORD (1809-97), Eng. doctor and diplomatist; surgeon during Carlist War (1836); afterwards did valuable consular work in China and Japan.

ALCOFORADO, MARIANNA (1640-1723), Franciscan nun; b. Beja, Portugal; famous as writer of passionate *Letters of a Portuguese Nun* (translated into Eng. by Edgar Prestage), addressed to her betrayer.

ALCOHOLISM, see **TEMPERANCE**.

ALCOHOLS, a group of organic compounds consisting of a hydrocarbon radical or group combined with one or more hydroxyl groups. According to the number of hydroxyl (a group consisting of an atom of oxygen and one of hydrogen—HO) groups present, monatomic, diatomic, triatomic, etc., a. may be distinguished, e.g. ordinary a. (ethyl a. $\text{CH}_3\text{CH}_2\text{OH}$), glycol (ethylene alcohol $\text{CH}_2\text{OH}\cdot\text{CH}_2\text{OH}$), glycerin (glycerol $\text{CH}_2\text{OH}\cdot\text{CHOH}\cdot\text{CH}_2\text{OH}$). Primary a's contain the group CH_2OH , and are oxidised to form a corresponding aldehyde or acid with the same number of carbon atoms. Secondary a's contain the group CHOH combined with two hydrocarbon radicals, and form ketones on oxidation and acids with a lesser number of carbon atoms on further oxidation. Tertiary a's are characterised by the group $\text{C}\cdot\text{OH}$ combined with three hydrocarbon radicals, and yield simpler compounds on oxidation.

'Spirits of wine' or ethyl alcohol is a colourless, mobile, inflammable liquid, B.P. 78°, M.P. 112°, S.G. .79, and is formed by the fermentation of saccharine liquids, the raw materials being grapes, barley and other cereals, potatoes, molasses, sugar, honey, apples, cherries, etc. It is used in beverages, in med., and for industrial purposes as a solvent or as fuel. In the latter case it is 'denaturated,' to avoid the high excise duty, by different agents according to the purpose for which it is required, methyl a. and pyridine being most commonly applied. Absolute a. contains only 1 % of water.

The physiological effects of a. on animal organisms are mainly depressant after a period of stimulation, and toxic effects appear when a. is taken in large quantities, causing diseases of stomach, liver, kidneys, heart, blood-vessels, and nervous system. As regards the hereditary consequences of chronic alcoholism

it may be said that alcoholism is in most cases not so much the cause as the effect of a disordered nervous system.—**Alcoholometry**, estimation of amount of a. in liquid either by **HYDROMETER** (*q.v.*) when a. diluted by water only, or in other cases by distilling it off.

ALCORAN, see **KORAN**.

ALCOTT, AMOS BRONSON (1799–1888), Amer. educationalist; was associated much with Emerson, and lectured on Transcendentalism; author of *Tablets* (1868), *Concord Days* (1872), and other books.

ALCOTT, LOUISA MAY (1832–88), Amer. authoress; popular writer for girls, her best-known books being *Little Women* and *Little Men*; dau. of above.

ALCOY (38° 42' N., 0° 26' W.), town, Spain; manufactures linen, paper. Pop. (1910) 34,000.

ALCUIN (b. 735), Eng. ecclesiastic and scholar; b. York; spent much time at court of Charlemagne, in whose realm he spread civilisation and learning; presided over famous school and abbey of St. Martin at Tours. A. wrote numerous graceful letters, several poems, and some theological treatises.

Gaskoin, *Alcuin: his Life and his Work* (London, 1903).

ALCYONARIA, see **ANTHOZOA**.

ALCYONE, **HALCYONE** (classical myth.), dau. of Æolus, who on her husband's death by drowning threw herself into sea and was changed, with him, into a kingfisher (halcyons). The birds are thought to calm the sea during the ('halcyon') days of their nesting.

ALDABRA (9° 30' S., 46° 20' E.), Brit. islands, Ind. Ocean; part of Seychelles colony. Grande Terre or South Island is largest, noted for giant tortoises, crustacea, and rare birds; chief industry, fishing. Pop. 127.

ALDAN (68° 30' N., 130° E.), navigable river, Siberia.

ALDBOROUGH (53° 50' N., 0° 6' W.), village, Yorkshire; Roman remains. Pop. 1839.

ALDEBARAN, α Tauri, red first-magnitude star having a brilliancy 27 times that of the sun, brightest star in the Hyades.

ALDEBURGH (52° 10' N., 1° 36' E.), town, Suffolk; Crabbe's birthplace. Pop. 2374.

ALDEGREVER, HEINRICH, ALDEGRAF (1502–58), Ger. artist and engraver; school of Dürer; ranks high among 'Little Masters.'

ALDEHYDES, organic compounds of the general formula R.OHO, in which R is an aryl or alkyl (*q.v.*), derived from alcohols by oxidation, and yielding acids when oxidised themselves, e.g. methyl alcohol (CH₃OH) yields formaldehyde (H.CHO) which may be oxidised to formic acid (H.COOH).

ALDEIA GALLEGA (38° 42' N., 8° 56' W.), small town, Portugal; mineral springs.

ALDEN, JOHN (d. 1687), Amer. settler; sailed in *Mayflower* (1620); romance of his life told in Longfellow's *The Courtship of Miles Standish*.

ALDER (*Alnus*), genus of shrubs or trees of the order Betulaceae, growing in moist places, often in thickets, in the N. temperate zone and W. South America. The wood is used by turners, and, owing to its durability under water, for piles in building (e.g. in Venice and Amsterdam), and the bark in tanning and dyeing.

ALDER-FLY (*Sialidae*), neuropterous (i.e. with net-veined wings) insects related to the ant-lions, with aquatic larvae.

ALDERMAN (A.S. *Ealdorman*), literally, 'older man'; hence counsellor and magistrate; in modern England, municipal officer advanced from ranks of city- or town-councillors; the Scot. equivalent is 'Baillie.'

ALDERNEY (49° 43' N., 2° 10' W.), most northerly of Channel Islands (*q.v.*); area, 1962 acres; coast outlined by rocks and reefs; 'Caskets' especially dangerous in bad weather; Race of A. separates island from Normandy; surface is level tableland;

vegetables, grain; once famous breed of cattle; capital, the picturesque town St. Anne; harbour at Braye. Pop. c. 2000.

ALDERSHOT (51° 14' N., 0° 46' W.), urban district, Hampshire. CAMP established, 1855; important buildings erected, 1881; reconstruction —, 1890. Marlborough Lines have field artillery and five infantry barracks; Stanhope Lines, Royal Engineers, Army Service Corps, and five infantry barracks. Pop. (1911) 35,175.

ALDHELM, **EALDMAN** (c. 640–709), bp. of Sherborne; studied under Hadrian, abbot of St. Augustine's, Canterbury, and became one of most learned men in England; wrote Latin verse and said to have known Gk. and Hebrew; abbot of Malmesbury, 675; bp. of newly created see of Sherborne, 705; his Latin works preserved, but his Old Eng. poetry has perished.

Wildman, *Life of St. Aldhelm* (1905).

ALDINE PRESS, see **MANUZIO**.

ALDINI, GIOVANNI (1762–1834), Ital. physicist, nephew of L. Galvani; undertook researches in galvanism and introduced improvements in life-saving appliances and lighthouses.

ALDOBRANDINI, SILVESTRO (1499–1558), Ital. jurist belonging to famous Florentine family. His s. IPPOLITO reigned as Pope Clement VIII. (1592–1605). Clement's nephew PIETRO (1572–1621) became cardinal and owned the villa whither was taken the antique fresco, discovered in Rome, 1606, and called the *Aldobrandinisch Wedding*.

ALDRED, or **EALDRED** (d. 1069), Eng. ecclesiastic; made bp. of Worcester (1044); abp. of York (1060), crowned William the Conqueror; first Eng. bp. to make pilgrimage to Jerusalem.

ALDRICE, HENRY (1647–1710), Eng. theologian, wit, philosopher, musician, and architect; Vice-Chancellor of Oxford Univ. (1692); his *Compendium Artis Logice* was used in Oxford until recent times.

ALDRICE, THOMAS BAILEY (1836–1907), Amer. novelist and poet; editor *Atlantic Monthly* (1881–90); author of *Prudence Palfrey* (1874), *Queen of Sheba* (1877), *The Stillwater Tragedy* (1880), and others; also several volumes of verse.

ALDRIDGE, IRA (1805–87), negro tragedian; took Shakespearian rôles, especially Othello, in London and abroad.

ALDRINGER, JOHANN, COUNT VON, or **ALDRINGEN** (1588–1634), Austrian commander; performed brilliant service under Tilly and Wallenstein; killed at defence of Landshut.

ALDROVANDI, ULISSE (1522–1605), Ital. naturalist, prof. of philosophy and med. at Bologna, where he founded a botanical garden. He compiled an interesting work which was to include the entire zoological knowledge of his time, and was also the author of botanical and pharmacological treatises.

ALDUS MANUTIUS, see **MANUZIO**.

ALE, fermented malt liquor; term now usually applied to a beer brewed by the surface fermentation process. See **BREWING**.

ALEANDER, HIERONYMUS (1480–1542), Ital. cardinal; sometime librarian of Vatican; one of Luther's fiercest opponents.

ALEARDI, ALEARDO, Count (1812–78), patriotic Ital. poet; author of *Arnaldo da Rocca* (1842); *Lettere a Maria* (1848).

ALEATORY CONTRACTS (Lat. *aleator*, a gambler), include bets, wagers, bottomry, insurance, and others depending on an uncertain event.

ALE-CONNER, old English official, appointed by Court leet, whose duty it was to examine all ales and beers offered for public consumption.

ALECSANDRI, VASILE, ALEXANDRI (1821–90), Rumanian poet and statesman; wrote and adapted several plays, and pub. volumes of original verse; popularised Rumanian folk-songs; Minister, Foreign Affairs (1859); Minister to France (1885).

ALECTO (classical myth.), one of Erinyes (q.v.) or Furies.

ALEMÁN, MATEO (b. 1547), Span. novelist, author of picaresque novel, *Guzmán de Alfarache* (1599).

ALEMANNI, ALAMANNI, Latinised form of name assumed by Teutonic horde formed from various tribes (All-men); began to encroach on Rom. empire, III. cent. A.D.; Caracalla opposed them on Maine, 211; forced south by Burgundians and made permanent settlements in S.E. Gaul in IV. cent.; defeated by Clovis, 496; formed into Frankish duchy Alemannia; one of their tribes, the Suovi, gave name to Swabia; from these invaders French called all Germans *Allemands*.

ALEMBERT, JEAN LE ROND D' (1717-83), Fr. philosopher and mathematician; b. Paris; s. of Chevalier Destouches and Madame de Tencin; brought up as a foundling, afterwards successively studied theol., law, and med., but then devoted himself wholly to math's. He published researches on the integral calculus, on the equilibrium and the motion of fluids, on the nutation of the axis of the earth, and other physical problems. After having been associated with Diderot in the compilation of the *Dictionnaire Encyclopédique* he published several literary and philosophical works. He acquired great fame during his lifetime, and was noted for his simple, generous, and independent character. He declined magnificent offers from Frederick the Great and Catherine of Russia of positions in Berlin and St. Petersburg, preferring to work for the Academy in his native city.

ALEMBIC, glass or metal apparatus formerly used by chemists in distillation; in a stricter sense the cap receiving the vapour and connected by a tube with the receiving vessel.

ALEMTEJO (38° 25' N., 7° 50' W.), old province, Portugal; crossed by several low mountain chains; chief rivers, Tagus, Guadiana; largest towns, Elvas, Evora; produces olive oil; medicinal springs. Pop. 416,000.

ALENÇON (48° 25' N., 0° 5' E.), town, Orne, France; gave name to famous point or lace. Pop. 14,378.

ALENÇON, COUNTSHIP AND DUKEDOM OF, title derived from the family of Yves, Lord of Bellesme, who in X. cent. held town of A., and was subsequently borne by various members of the house of Valois, including Charles of V., killed at Creçy (1346); John IV., who fell at Agincourt (1415); John V., the comrade of Joan of Arc (1409-76); Charles IV., who m. Marguerite of Valois, sister of Francis I. (d. 1525); Francis, s. of Henry II. (1554-84), who became Duke of Anjou. In later times the title has been held by Ferdinand of Orleans, grandson of Louis-Philippe.

ALENIO, GIULIO (1582-1640), Ital. Jesuit missionary; spent thirty years in China, where he died; wrote *Life of Christ* in Chinese, which is still used.

ALEPPO (36° 30' N., 37° E.), vilayet, Asiatic Turkey; fertile plains; seaport, Alexandretta. Pop. c. 1,500,000.—**Aleppo** (36° 12' N., 37° 7' E.), capital of above; very important trade centre before discovery of sea-route to India; conquered by Saracens, 638 A.D.; taken by Saladin, 1183; subsequently by Mamelukes; conquered by Turks, 1517; suffered earthquakes, 1170, 1822; plague, 1827, cholera, 1832. Manufactures carpets, leather goods, silk, cotton, and woollen materials; produces cereals, fruit. Pop. c. 200,000.

ALESHKI (46° 35' N., 32° 45' E.), town, on Dnieper, Russia; fruit, fisheries.

ALESIA (47° 32' N., 4° 30' E.), hill, France; modern, Alise Ste Reine. See JULIUS CÆSAR.

ALESIIUS, ALEXANDER (1500-65), Scot. preacher; b. Edinborough; converted to Protestantism by Patrik Hamilton; imprisoned and found guilty of heresy, but escaped to Germany where he met Melancthon and Luther and cast in his lot with the Reformers; prof. at Frankfort-on-the-Oder and Leipzig.

ALESSANDRIA.—(1) (44° 54' N., 8° 39' E.) Cathedral town, fortress, and railway centre, Italy; called after Pope Alexander III.; near field of Marengo. Pop. (1911) 76,000. (2) Province, N. Italy. Pop. 807,000.

ALESSI, GALEAZZO (1512-72), Ital. architect; designed palaces in Genoa, parts of Escorial, etc.

ALETHIOLOGY, the science which treats of truth and error.

ALETSCHHORN (46° 29' N., 8° E.), second highest point (13,720 ft.), Bernese Alps; overlooks Aletsch glacier, greatest glacier in Europe.

ALEURITES, genus of Eastern and Polynesian trees, order Euphorbiaceæ, cultivated for its fruit, which yields seeds rich in oil, used for candle-making and varnishes.

ALEURONE, albuminoid grains found in ripe seeds.

ALEUTIAN ISLANDS (52° N., 175° E.), long series of islands, Pacific; extend over 1000 miles towards Kamchatka from Alaska Peninsula; many are volcanic; largest Unimak, has two volcanoes; principal industries, fishing, hunting, sealing; Unalaska is sealing and whaling centre; discovered by Russ. explorers, Chirikov and Bering, 1741. Inhabitants (Aleuts) are of Eskimo origin; peace-abiding; converted to Gk. Church. Pop. c. 2000.

ALEWIFE (or Gaspereau), a fish of herring family, frequenting N. Amer. coast rivers.

ALEXANDER (1461-1506), King of Poland; s. of Casimir IV.; owing to his poverty was unable to resist incursions of Tartars who overran Poland during his reign.

ALEXANDER, name of eight Popes.

ALEXANDER II., Pope (1061-73); deposed by Council of Mantua. **ALEXANDER III.**, Pope (1159-81); antagonist of Frederick Barbarossa; presided at Lateran Council, 1179, which decreed a two-thirds majority of cardinals requisite for papal elections; very powerful in the Europe of his day. **ALEXANDER IV.**, Pope (1254-61); tried to reconcile Eastern and Western Churches. **ALEXANDER V.**, Pope (1409-10); elected by Council of Pisa, a scholar and theologian. **ALEXANDER VI.** (Rodrigo Borgia), Pope (1431-1503); nephew of Calixtus III. He was early promoted in the Church, and showed signs of worldliness and immorality. He won his election by bribery, and during his pontificate his one great aim was to provide handsomely for his natural children; the best known of these were Giovanni, Duke of Gandia, Cesare and Lucrezia Borgia. The Duke of Gandia was murdered, probably by his bro. Cesare, who was made gov. of the Papal States. A. lived an utterly worldly life and has a worse reputation than any other Pope, and was very bad, even judged by the standard of a corrupt age. **ALEXANDER VIII.**, Pope (1689-91); refused to recognise liberties of the Gallican Church.

ALEXANDER ARCHIPELAGO (55° N., 133° W.), islands (over 1100) stretching along coast, Brit. Columbia.

ALEXANDER I. (1078-1124), King of Scotland; s. of Malcolm Canmore and St. Margaret; founded abbeys of Soone and Inchcolm.

ALEXANDER II. (1198-1249), King of Scotland; succ. I., William the Lion; commenced warlike operations against Norsemen, to whom the Western Isles were subject; a good and wise king.

ALEXANDER III. (1241-85), King of Scotland; s. of above; renewed hostilities against King Haakon, whom he defeated in a sea-fight at Largs. Finally the Western Isles and Isle of Man were ceded to Scotland, Orkney and Shetland still being held by Norsemen; gave Scotland unprecedented peace and prosperity.

ALEXANDER I. (1777-1825), Tsar of Russia; s. of Paul I. who was murdered (1801). He commenced his reign with the warmest desire to promote his people's welfare, and to improve the administration

of Russia. Napoleon made strenuous efforts to secure A.'s friendship and adherence, and dazzled him with extravagant promises. But their amiable relations gradually changed to a settled hatred which culminated in Napoleon undertaking the disastrous invasion of Russia, the final downfall of the Fr. Emperor leaving A. the most powerful European sovereign. The brilliant promise of the Tsar's youth with regard to his country's internal progress was not realised, for he left an administration of veiled tyranny; a disaffected army; a worthless educational system; and an exhausted treasury. At the same time it should be stated that A. had many attractive personal qualities which served to render him very popular.

ALEXANDER II. (1818-81), Tsar of Russia; s. of Nicholas I.; nephew of Alexander I.; m. Princess Marie of Hesse (1841); succ. 1855, during progress of Crimean War; emancipated 23,000,000 serfs, 1861; extended Russian Empire in Central Asia and the Caucasus; waged war on Turkey on behalf of Slavs, 1877-78; much of latter part of his reign was taken up with efforts to suppress the revolutionary party; assassinated by bombs (March 13).

ALEXANDER III. (1845-94), Tsar of Russia; s. of Alexander II.; m. Princess Dagmar of Denmark, 1866; spent most of life in seclusion of palace; favoured reactionary policy in internal affairs; cultivated friendship of France.

ALEXANDER I. (342 B.C.), King of Epirus; bro. of Olympias, Alexander the Great's mother; m. Cleopatra, Philip of Macedon's dau.

ALEXANDER (III.) THE GREAT (356-323 B.C.), King of Macedon; s. of Philip II. of Macedon, and Olympias, sister of Alexander I. of Epirus. Educated under the direction of Aristotle, he was left in charge of the kingdom at the age of sixteen when his f. advanced against Byzantium. During this period he displayed remarkable courage when leading the charge which broke the Sacred Band of Thebans at *Chéronée* (338). Two years later Philip was assassinated, and A. succeeded to the throne. His first business was to put down risings of the Illyrians and Triballians, but scarcely had order been restored when news came that the Thebans had taken up arms, and that the Athenians were about to join them. A. then, by a rapid march, took the Thebans by surprise, conquered and razed their city, sparing only the house which had been occupied by the poet Pindar. Many thousands of the inhabitants were slain, and 30,000 sold into slavery. This severity reduced Greece to obedience.

The king next prepared for a war against Persia; crossed the Hellespont (334) with 35,000 men, and won a brilliant victory over the Persians at the river *Granicus*. As a consequence many of the cities of Asia Minor opened their gates to the victor, though some of the fortresses made a brave show of resistance, and it was during this campaign that A. severed the 'Gordian knot' (q.v.), which, it was fabled, could only be done by the conqueror of Asia. He next marched against the army of Darius, whom he completely overthrew at *Iesus* (333), when the immense treasures of the Persian, as well as the family of Darius, fell into his hands, though the leader himself escaped. A. next subdued the principal cities of Syria; marched victoriously through Palestine; overran Egypt, and founded the city of Alexandria (331). Marching through the Libyan desert to consult the oracle of Ammon, he was hailed by the priest as the offspring of Zeus. Inspired with this thought of invincibility he again marched against Darius, whom he routed at *Arbela*, though far outnumbered by the Persians. Darius escaped, but Babylon and Susa surrendered their vast treasures to the conqueror, who soon afterwards marched triumphantly into Persepolis, the Persian capital. A.'s next great undertaking was the invasion of India (326), when, having conquered the Punjab, he was compelled

to return to Persia through a spirit of unrest which had taken hold of his troops. During one of the battles in India the king's famous charger, Bucephalus (q.v.), was killed. Upon his return to Babylon A. was suddenly smitten with fever, dying in eleven days, in his thirty-second year. He was buried in a golden coffin at Alexandria, and received divine honours. Great as were most of the actions of A., he appears to have become intoxicated with success, and fell into habits of debauchery. In one of his drunken fits he set fire to and destroyed Persepolis at the bidding of one of his courtesans.

Wheeler, *Life* (1900); Mahaffy, *A.'s Empire* (1887).

ALEXANDER OF BATTENBERG (1857-93), 1st Prince of Bulgaria (elected, 1879); 2nd s. of Prince Alexander of Hesse, and nephew of Tsar Alexander II.; was deposed (1886) and handed over to Russian authorities, but was recalled, and voluntarily resigned immediately afterwards.

ALEXANDER I., OBSSENOVICH (1876-1903), King of Serbia; succ. his f., King Milan, who abdicated, 1889; A. and Queen Draga were murdered in palace, June 11.

ALEXANDER, ARCHIBALD (1772-1851), Amer. Presbyterian preacher and author; first prof. of Theol. at Princeton; wrote *Brief Outline of the Evidences of the Christian Religion* (1825), which has passed through many editions.

ALEXANDER, BOYD (1873-1910), Eng. explorer, killed in Central Africa.

ALEXANDER, SIR GEORGE (1858-), Eng. actor; family name, Samson; first appearance, 1879; knighted, 1911.

ALEXANDER, SIR JAMES EDWARD (1803-85), Brit. general and traveller; served in Africa, Canada, Crimea, and Maori War; wrote numerous books of travel.

ALEXANDER, JOHN, CUZA (1820-73), Prince of Rumania, 1861; dethroned, 1866.

ALEXANDER NEVSKY, ST. (1220-63), Grand-Duke of Vladimir; defeated Swedes on banks of Neva, 1240; devoted his whole life to service of Russia and Russian Church, for which he was canonised.

ALEXANDER SEVERUS (222-35 A.D.), Rom. Emperor; Syrian prince by birth; proclaimed Emperor at fourteen by the Prætorians, after murder of Heliogabalus; dominated by his mother, Julia Mama, and others; slain in Gaul by mutinous troops; possessed many excellent qualities as emperor.

ALEXANDER, WILLIAM (1824-1911), late Prot. abp. of Armagh and primate of all Ireland; also well known as a poet, being author of *St. Augustine's Holiday and Other Poems* (1887). His wife was a noted hymn writer.

ALEXANDER, WILLIAM LINDSAY (1808-84), Scot. Congregational preacher and Biblical scholar.

ALEXANDER OF APHRODISIAS (II. cent. A.D.), celebrated Gk. commentator on Aristotle; opposed the doctrine of immortality.

ALEXANDER OF HALES, 'DOCTOR IRREFRAGABILIS' (XIII. cent.), Eng. Franciscan theologian; wrote *Summa Universæ Theologiae*, which was extensively used as a manual of religious instruction.

ALEXANDERS, ALEXANDER (*Smyrniun Olusatrum*), European herbaceous umbelliferous plant sometimes cultivated and used as celery; the name is applied to *Thaspium aureum* in U.S.A.

ALEXANDRA (30° 20' S., 30° 30' E.), division, S.E. coast, Natal. Pop. 53,000 (1300 white).

ALEXANDRA NILE, KAGERA (1° S., 32° E.), headstream of Nile, navigable 70 miles.

ALEXANDRA, QUEEN (1844-), eldest dau. of Christian IX. of Denmark, wife of Edward VII. (m. 1863), and mother of George V.

ALEXANDRETTA, ISKANDREUN (36° 34' N., 36° 10' E.), town, North Syria; port for Aleppo. Pop. c. 10,000.

ALEXANDRI, VASILE, see **ALEXANDRI**.

ALEXANDRIA (31° 12' N., 29° 54' E.), seaport, Egypt. Modern city is built on peninsula between Mediterranean and Lake Mareotis, and on isthmus joining Pharos (q.v.) to mainland; fine harbour; floating dock; graving dock (opened, 1905); torpedo station; to S. are Pompey's Pillar, catacombs cut out of hills, and Arab cemetery; well provided with railway and telegraphic communications; exports raw cotton, sugar, etc.; imports coal, textiles, machinery. City consisted of Brucheum (Gk. quarter) in E., Rhacotis (Egyptian quarter) in W., and Jews' quarter in N.E. In first were Museum with famous library, royal residence, Cleopatra's needles, Ptolemaic palaces, Poseidon; in second were Pompey's Pillar, Serapeum, Necropolis.

History.—Founded by Alexander the Great, 332 B.C.; became great intellectual and commercial centre under Ptolemies; taken by Julius Caesar, 48 B.C.; suffered persecution under Caracalla, 215 A.D.; taken by Persians, 616; by Arabs under Amr, 640; twice taken by Greeks; retaken by Amr, who destroyed fortifications; city henceforth declined; taken by Turks, 1517, under whose misrule further decayed; prosperity revived under Mehemet Ali, in XIX. cent.; taken by Napoleon, 1798; by British, 1801; bombarded by British during Arabi Pasha's rebellion, 1882. Pop. 332,246.

Alexandrian School, name given to that later phase of Gk. culture whose centre was at Alexandria, which lasted from IV. cent. B.C. to the Muhammadan conquest of Egypt in the VII. cent. A.D. The best days of Hellenic civilisation were over, and the spirit of freshness had gone out of Gk. life, but there was still an 'afterglow.' The Alexandrians were learned rather than original. Most of their work was philosophical or religious; there was a large Jewish population in Alexandria, and Gk. philosophy and Jewish monotheism approached each other, meeting in Philo. Neoplatonism, an amalgam of Platonic, Stoic, and Oriental elements, was evolved, and through Origen and Clement of Alexandria influenced Christian Theology.

Kingsley, *Alexandria and the Schools*; Rigg, *Christian Platonists of Alexandria*; Kiepert, *Zur Topographie des alten Alexandria* (1872).

The **Alexandrian Libraries** were formed by the Ptolemies in buildings known as Brucheum and Serapeum; that in former said to have perished on occasion of Caesar's attack, 47; latter destroyed by Theodosius, c. 389 A.D.

ALEXANDRIA.—(1) (40° 14' N., 85° 40' W.) town, Indiana. Pop. (1910), 5096. (2) (31° 20' N., 92° 26' W.) town, Louisiana; occupied by Union, 1863, 1864. Pop. (1910) 11,213. (3) (43° 56' N., 25° 20' E.) town, Rumania. Pop. 13,675. (4) (55° 59' N., 4° 35' W.) town, Dumbartonshire. Pop. c. 10,000. (5) (38° 47' N., 77° 3' W.) town, Virginia; many XVIII.-cent. buildings; manufactures fertilisers, shoes, beer, bottles, leather; occupied by Federalists in Civil War. Pop. (1910) 15,329.

ALEXANDRIA TROAS (39° 46' N., 26° 10' E.), ancient town, Troad; ruined.

ALEXANDRIAN CODEX, **CODEX ALEXANDRINUS**, copy of Gk. New Testament (almost complete) with 1 and 2 Clement; compiled in uncial script of V. cent. (Brit. Mus.).

ALEXANDRINA LAKE (35° 27' S., 139° 10' E.), S. Australia, at mouth of Murray River.

ALEXANDRINE, **IAMBIC HEXAMETER**, verse of 6 feet (with caesura usually after third foot). Named from metre used in O. Fr. poems on Alexander the Great; example: 'Of fan | oy, réas | oh, vîr | tûe, nought | cân mê | bèrewê.'

ALEXANDRISTS, philosophers of Renaissance period who repudiated the possibility of immortality.

ALEXANDRITE, green gemstone, a variety of (g.v.), appearing red in transmitted or t., found in the Urals, also in Ceylon and

Tasmania.

ALEXANDRIYA (48° 40' N., 33° 20' E.), chief town, Kherson, Russia.

ALEXANDROPOL (40° 47' N., 43° 45' E.), town, Transcaucasia. Pop. 32,735.

ALEXANDROV (56° 30' N., 38° E.), manufacturing town, Vladimir, Russia; steel, cotton. Pop. 7000.

ALEXANDROVSK.—(1) (47° 49' N., 35° 7' E.) town, S. Russia. Pop. 16,393. (2) (69° 10' N., 33° 20' E.) town, N. Russia. (3) (51° 18' N., 143° E.) principal town, Russian district, Sakhalin Island.

ALEXANDROVSK-GRUSHEVSKI (48° N., 40° 30' E.), small town, Don Cossacks, Russia; coal.

ALEXANDROVSKY (59° 46' N., 30° 20' E.), manufacturing town, S.E. of St. Petersburg, Russia; cotton mills.

ALEXEI, MICHAILOVICH, ALEXIS or **ALEXIUS** (1629-76), Tsar of Russia; f. of Peter the Great; a progressive ruler.

ALEXEI, PETROVICH (1690-1718), Russ. Tsarevich; s. of Peter the Great; was of a studious, unheroic disposition, and held in the greatest contempt by his f. After leading a life of terror for a number of years, A. fled to Vienna and sought the protection of Charles VI. This escapade increased his f.'s hatred, and, it having been discovered that he desired Peter's death, he was put to torture, and died.

ALEXEYEVKA (60° 40' N., 38° 45' E.), small town, Voronezh, Russia.

ALEXINATZ (43° 32' N., 21° 43' E.), town and province, Servia; tobacco.

ALEXIS, WILLIBALD, pseudonym of Georg Wilhelm Heinrich Häring (1798-1871), Ger. hist. novelist and poet. His *Walladmor* (1823) imitated Scott's novels.

ALEXISBAD (51° 35' N., 11° E.), town, Germany. Pop. 1000.

ALEXIUS I., COMNENUS (1048-1118), Byzantine emperor; succ., 1081; reformed administration; besought help of West against Turks, and so brought about First Crusade.

ALEXIUS II. (1167-83), Byzantine emperor; deposed by Andronicus Comnenus, and afterwards strangled.

ALEXIUS III., ANGELOS (c. 1195), Byzantine emperor; in 1203 the Crusaders, led by Dandolo, besieged Constantinople and carried it by storm. A., a weak and debauched ruler, fled into Thrace, but afterwards surrendered, and d. in a monastery at Nicæa.

ALEXIUS V., DUCA (c. 1204), Byzantine emperor; put to death by the Crusaders for murder of Alexius IV.

ALEYN, SIMON, see BRAY.

ALFALFA, Span. name for lucerne (g.v.).

ALFANI, DOMENICO (c. XV. cent.), contemporary and friend of Raphael.

ALFARABI (c. 870-950), distinguished Arab philosopher; first to attempt encyclopædic work.

ALFELD (51° 59' N., 9° 49' E.), town, Germany. Pop. 4900.

ALFIERI, VITTORIO, COUNT (1749-1803), Ital. poet; b. at Asti; becoming independent by the death of his f. and uncle, lacked any systematic training, but was interested in lit. and had a passion for travel. He had a series of love affairs, one of which got him into trouble in London. His tragedy, *Cleopatra*, was staged at Turin, 1775. He formed an attachment with the Countess of Albany (g.v.), lived with her in Paris and latterly in Florence. He wrote several more tragedies, which have earned for him a great reputation. His characterisation is more effective than his style.

ALFÖLD, extensive productive plain, Hu

ALFONSINE (44° 28' N., 12° 2' E.), Ravenna, N. Italy.

ALFONSO, Castilian form of Alphonso, a name borne by many kings in Spain and Portugal.

ALFONSO VIII. (1158-1214), of Castile, was the most noted of the Spanish line; destroyed power of

Almohades (1212) with body of Crusaders; founded first Span. university, Palencia.

ALFONSO X., 'The Learned' (1252-84), encouraged letters and the study of astronomy.

ALFONSO XI., 'The Avenger' (1312-50), achieved brilliant victory over African invaders.

ALFONSO XII. (1857-85), established peace at home and abroad; won love of people by his kindness d. of phthisis, Nov. 24; was succ. by s.

ALFONSO XIII. (1886-), b. May 17, after f.'s death, his m., Maria Christina, acting as regent during his minority; m. Princess Ena of Battenberg, May 31, 1906.

ALFONSO I. (1094-1185), first of Portuguese line, famous for his battles with Moors; revered as saint by Portuguese.

ALFORD, HENRY (1810-71), Eng. divine, poet, and scholar; Dean of Canterbury (1875); first editor *Contemporary Review*; edit. Gk. Testament.

ALFRED COUNTY (30° 40' S., 30° 15' E.), division, S. Natal. Pop. 27,000 (400 white).

ALFRED ERNEST ALBERT, DUKE OF SAXE-COBURG AND GOTHA (1844-1900), 2nd s. of Queen Victoria; trained for navy; cr. Duke of Edinburgh (1865); Admiral of the Fleet (1893); succ. his uncle, Ernest II., as Duke of Saxe-Coburg (1893).

ALFRED THE GREAT (848-c. 900), King of England; b. at Wantage; began campaign against Danes in Æthelred's reign; fought nine battles, 870-1; successful at Englefield and Ashdown; succ., 871; twice defeated by Danes, 871; made peace. Danes again invaded Wessex, 878, when A. retired temporarily to Athelney; raised army and defeated Danes at Edington, 878; cleared Wessex and Mercia of invaders by 879; struggle renewed, 893; after four years of varying success A. finally liberated country, and Danes gave up struggle. During peace, A. enlarged navy, founded schools, introduced juridical reforms; translated works by Orosius, Bede, and Gregory.

Plummer, *Life and Times* (1902).

ALFRETTON (53° 6' N., 1° 23' W.), town, Derbyshire, England. Pop. (1911) 19,000.

ALFUROS, name of uncertain origin, applied by Malays to all the primitive non-Muhammadan tribes of the eastern islands of the Malay Archipelago.

ALGÆ, group of cryptogamous plants including the seaweeds, characterised by the absence of a differentiation into root, stem, and leaf, and by the presence of chlorophyll (*q.v.*) with or without an additional colouring matter to utilise, in the presence of sunlight, the carbon contained in the carbonic acid gas (CO_2) of the atmosphere. They vary in size from microscopic forms consisting of one cell (*Protophyta*) (*q.v.*) to the *Macrocystis* of southern seas with fronds 700 ft. in length. The a. are a group difficult to define. Some of the simplest types are sometimes classified as Protozoa (*q.v.*), and as no line of demarcation can be drawn between them, it seems expedient to adopt Haeckel's term *Protista* to include both unicellular plants and animals. On the other hand, certain a. closely resemble a group of fungi, called *Phycomycetes* in consequence. It is established that all fungi are derived from the a. One of the most interesting discoveries in bot. was that of the lichens being found to consist of a. and fungi in close nutritive relationship or symbiosis. Owing to their heterogeneous character and the present lack of knowledge concerning many genera and their relationships, it is not possible to construct a genealogical tree for the a.; however, the following classification will facilitate a survey of the group.

Chlorophyceæ (green a.) occur in fresh and salt water and multiply both sexually and asexually. *Pleurococcus* is a round green cell abundant on damp surfaces and multiplies by division. Other forms (*e.g.* *Euglena*) are provided with flagella with which they swim about freely. The fresh-water *Volvox* (*q.v.*) consists of a spherical colony of flagellate cells con-

nected by strands of protoplasm, or it may be regarded as an individual animal which is differentiated into nutritive and reproductive cells. In the forms possessing a multicellular thallus the latter is frequently branched, and the *Characeæ* show a differentiation of parts resembling the morphology of higher plants. Over 3000 species are known.

Cyanophyceæ (blue a.) contain a blue colouring matter in addition to chlorophyll, and show a great variety of different shades, from yellow green to red and violet. The cells are mostly small, and the *Bacteriaceæ*, though much modified owing to parasitism, are closely allied to the unicellular types. Multicellular species are common in fresh water. Over 900 species are known.

Phaeophyceæ (brown a.) contain brown colouring matter (phycochrome) in addition to chlorophyll, and include such types as the common seaweeds *Fucus vesiculosus* and *F. serratus*, the gigantic *Macrocystis*, and the unicellular *Peridiniaceæ* and *Diatomaceæ*, the latter being important constituents of the plankton forming the diet of many marine animals. Both sexual and asexual reproduction occur in the P., and show interesting modifications in different species. Over 6200 species, fossil and recent, are known, about 5000 of which are *Diatomaceæ*.

Rhodophyceæ, or *Florideæ* (red a.), contain a red colouring matter (phycoerythrin) in addition to chlorophyll, and are all multicellular. They are very highly specialised, especially their modes of reproduction, and comprise about 1400 species. Some species are used as manure, and the ash—kelp in Scotland, varec or vrac in the coasts of Brittany—is used as a source of iodine.

ALGARDI, ALESSANDRO (1602-54), It. sculptor; executed bronze statue of Innocent X., and gigantic alto-relievo of Pope Leo and Attila; friend of Velasquez.

ALGARROBA, see CAROB.

ALGAROTH, POWDER OF ($\text{Sb}_2\text{Cl}_3\text{O}_2$?), precipitate of antimony trichloride in solution with excess of water, formerly used as an emetic and purgative.

ALGAROTTI, FRANCESCO, COUNT (1712-64), Ital. philosopher, poet, and art critic; patronised by Frederick the Great.

ALGARVE (37° 5' N., 8° W.), southernmost province, Portugal; area, 1937 sq. miles; mountain ranges in N.; fruit and fisheries. Pop. 255,000.

ALGAU (47° 40' N., 10° E.), district, Bavaria; noted for cattle.

ALGEBRA, a branch of math's covering a great variety of subjects, many of which are symbolic extensions of arithmetic, while others involve such special ideas that they may be regarded as practically distinct subjects.

History.—The invention of a. probably dates back to at least 1700 B.C., but the a. of the Egyptians (among whom it probably originated) was of course very elementary. The beginnings of a. are found in the work of Diophantus of Alexandria (IV. cent.), of which only Gk. and Lat. translations remain, the original being lost. This work, probably based on those of still earlier writers, is almost the only evidence that a. was known to the Greeks. Little progress in math's was made by the Romans, but among the Hindus and Arabs many notable advances were made. The latter introduced a. into Spain, and Cordova, the capital of the Moorish empire, became famous for its learning. The first Arabian treatise on a. was that of Muhammad Ben Musa (IX. cent.). This work was subsequently translated into Italian, and as the Moorish empire waned, Italy became the leader in mathematical investigation.

The first printed work (1494) dealing with a. (also with arithmetic, etc.) was that of Luca Pacioli da Borgo, a monk of Venice. Much was done by Tartalea, Cardano, and others in extending the knowledge of the solution of equations, the *Ars Magna* (1545) of

Cardano containing Tartalea's method of solving cubic equations. Progress was also made in Germany, France, and England, the chief improvement being the introduction of a more complete system of notation. Stifel invented the signs $+$, $-$, $\sqrt{}$, and Recorde the sign $=$. François Vieta, a Fr. mathematician (1540-1603), was the first to use general symbols for known as well as for unknown quantities, thus beginning the great extensions of modern algebra. Up to the XVII. cent. a . and geometry had been practically independent, but in 1637 Descartes united the two sciences. His *Geometria* is a treatise on the algebraic representation of geometrical theorems, but he was not the first to apply a . to geometry, that having previously been done, though not to such an extent, by Vieta. The XVII. cent. saw tremendous advances in all branches of scientific work, and in mathematics many new fields were opened up. Among the names of those who took a leading part are those of Newton, John Wallis, Euler, the Bernoullis, Fermat, Leibnitz. In later years a . has been developed on more and more specialised lines.

Principles of Algebra (see also ARITHMETIC).

PRELIMINARY NOTIONS.—The elementary operative symbols, $+$, $-$, \times , \div , have the same functions as in arithmetic. When these symbols occur in compound expressions some convention is needed to avoid confusion. Thus, in the expression $a+b+c \times d-e$, we should get totally different results if we perform the operations (i.) from left to right, (ii.) from right to left, (iii.) taking the division sign first, etc. It is convenient to regard the multiplication sign \times as being the closest bond between two quantities, next in order coming the sign of division \div , and the symbols $+$ and $-$ being taken in order from left to right. Thus in the above example we should first multiply the value of c by that of d , then divide b by the result, add the quotient to a , and finally subtract e from the result of the latter operation; but unless this convention is adopted, the meaning of such an expression must be made clear by means of brackets, thus: $[a+\{b+(\frac{c}{d})\}]-e$, the brackets being taken in the order (i.), (ii.), (iii.). For simplicity and convenience the sign \times is often replaced by a dot, or is omitted altogether. Thus $3 \times a \times b \times c$ may be written $3.a.b.c$ or $3abc$. Again, if a number be multiplied by itself any number of times it is usual to express the continued product (P) in the form x^n , where x is the quantity dealt with, and n the number of such quantities multiplied together. Thus p^4 is an abbreviation for $p \times p \times p \times p$. The number n is called the *index*, and the result P ($=x^n$) is the n^{th} power of x .

A **NEGATIVE QUANTITY** may be defined as a quantity such that if a positive quantity of equal magnitude be added to it the result is zero. The idea is made clearer by illustration. Thus, if a person has to receive £10 and pay £3, his gain would be +£7. If he pays first he then has -£3; this may be regarded as a debt of £3 which will require £3 of the £10 he is to receive to liquidate it, leaving a net gain of £7. If, on the other hand, the man is to receive £3 and has to pay £10, the net result is a debt of £7, so the man may be regarded as having -£7.

Any number of positive and negative quantities may be grouped together, and the result obtained after all the addition and subtraction operations have been performed is known as the *algebraic sum* of these quantities.

COMMUTATIVE LAW.—(a) Additions and subtractions, (b) Multiplications, may be made in any order. Thus—

$$p+q-r-s+t=p+q+t-r-s=p-r+q-s+t$$

$$p \cdot q \cdot r \cdot s \cdot t = p \cdot q \cdot t \cdot r \cdot s = p \cdot r \cdot q \cdot s \cdot t$$

ASSOCIATIVE LAW.—The terms of an expression may be grouped in any manner. Thus—

$$p+q-r-s+t=(p+q)+(t-s)-r=p+(q-s)+t-r$$

$$p \cdot q \cdot r \cdot s \cdot t=(p \cdot q) \times (t \cdot s) \times r=p \times (q \cdot s) \times (t \cdot r)$$

DISTRIBUTIVE LAW.—The product of a compound expression by a single factor is the algebraic sum of

the partial products of each term of the compound expression by that factor.

Thus $(a+b)c=ac+bc$; and $(a-b+c)d=ad-bd+cd$.

RULES OF SIGNS.—In multiplying together algebraic expressions, products occur of positive and negative quantities. If two positive or two negative quantities are multiplied together, the resulting product is in both cases positive. If a positive and a negative quantity are multiplied together, the result is negative.

Elementary Algebra (REAL QUANTITIES).—As a general rule, it is better to consider particular numerical examples before proceeding to general formulae. The verification of such formulae as $(a+b)^2=a^2+2ab+b^2$ is of considerable value in fixing them in the student's mind, and examples such as the above lead to a better understanding of the commutative and distributive laws.

DEFINITIONS.—An expression consisting of the product of a number of quantities (e.g. $5xyz^2a^3$) is known as a *monomial* expression, and the quantities multiplied together are *factors* of the expression. The number of the quantities is the *degree* of the expression; thus $5xyz^2a^3$ is of degree 8, since it is the product of 1 x , 4 y 's, and 3 a 's. In considering the degree of an expression, it must be remembered that only the letters are considered, the numerical factor, or *coefficient*, not being included.

An expression consisting of several monomial expressions, or *terms*, connected by $+$ and $-$ signs is a *polynomial* or *multinomial*. An expression of two terms is thus a *binomial*, one of three terms a *trinomial*, and so on.

The *degree* of a polynomial expression is the degree of the term of highest degree in the expression. Thus, $3abx^2+4cx^3+d$ is of the 6th degree. But often such expressions are regarded with respect to only one quantity; the expression above is thus of the 4th degree in x , and of the 1st degree in either a , b , c , or d .

LAW OF INDICES.—The product of a^m and a^n is a^{m+n} , for a^m is the continued product of m a 's, a^n is the continued product of n a 's, and so in the final result we have the continued product of $(m+n)$ a 's, which by definition is a^{m+n} . Similarly the quotient $a^m \div a^n = a^{m-n}$. The processes can obviously be extended to any number of processes of multiplication and division of powers of a single quantity.

Fractional and Negative Indices.—Since, by the above rules, $a^1 \times a^1 \times a^1 = a^3 = a$; and also $\sqrt[3]{a} \times \sqrt[3]{a} \times \sqrt[3]{a} = a$; we identify $a^{\frac{1}{3}}$ with $\sqrt[3]{a}$.

So $a^{\frac{1}{2}} = (a^1)^{\frac{1}{2}} = (\sqrt[2]{a})^1 = \sqrt[2]{a}$.

Again, in the quotient $a^m \div a^n = a^{m-n}$, if n is greater than m , $m-n$ is negative; e.g. $a^3 \div a^5 = a^{-2}$.

But it is easy to see that $\frac{a^3}{a^5} = \frac{1}{a^2}$. Hence $a^{-2} = 1/a^2$.

Similarly, $a^{-n} = \frac{1}{a^n}$.

A particular case of this is when $m=n$, when we have $a^m \div a^m = a^0 = 1$.

All these results are of importance in the theory of *logarithms* (q.v.).

The *least common multiple* and *highest common factor* of monomial expressions can be written down at once, for the L.C.M. must contain every factor of every expression, and so is the continued product of the highest powers of all the quantities which occur in the expressions.

EQUATIONS.—Algebraical statements of equality between two expressions are known as equations. They may be divided into two classes—(i.) *Identities*, (ii.) *Equations of condition*. An *identity* simply states equality of numerical results. Thus, when we say that $x^2 - a^2 = (x+a)(x-a)$, we mean that if x and a have definite numerical values, then the result of performing the operations denoted by $x^2 - a^2$ is the same as the result of multiplying the value of $(x+a)$ by that of $(x-a)$.

An equation of condition is only true for certain definite values of the quantity or quantities concerned. Thus the equation $5ax - 3a^2 = 3ax + 5a^2$ is only true when x is numerically equal to $4a$. The process of finding the values of the unknown quantity occurring in any such equation which make that equation true is known as the solution of the equation. This is effected by transformation. The rules for such transformation may be derived from a general theorem, which may be stated thus: 'The results of operating in any and the same manner on both sides of an equation are equal.' This general theorem should be verified first by numerical examples. From this we at once derive the rule of transposition, that any term may be transposed from either side of an equation to the other, providing we change its sign. For if $A + B - C + D = X - Y$, we have, subtracting D from both sides, $A + B - C + D - D = X - Y - D$, i.e. $A + B - C = X - Y - D$, so that the D term appears now on the right-hand side with its sign changed. Similarly, if

$\frac{P}{Q} = \frac{R}{S}$, we have, multiplying both sides by QS , $\frac{P}{Q} \cdot QS = \frac{R}{S} \cdot QS$, which gives $PS = QR$, and hence we deduce the rule for cross-multiplication.

The solution of simple equations, i.e. equations involving only the first power of the unknown quantity, is easily effected by the use of the above principles. Quadratic equations (which contain no higher powers of the unknown quantity than the second), and equations of higher degree, are more difficult. For further information, see EQUATIONS.

BINOMIAL THEOREM.—The binomial theorem gives a formula by which any binomial can be raised to any assigned power. Particular simple cases are $(x+a)^2 = x^2 + 2ax + a^2$, $(x+a)^3 = x^3 + 3ax^2 + 3a^2x + a^3$. The general result is that—

$$(x+a)^n = x^n + {}^nC_1 ax^{n-1} + {}^nC_2 a^2 x^{n-2} + \dots + {}^nC_r a^r x^{n-r} + \dots + a^n,$$

which is true when n is a positive integer. nC_r denotes the number of ways in which a group of r things can be selected from a set of n things, and is given by the formula ${}^nC_r = \frac{n(n-1)(n-2)\dots(n-r+1)}{1 \cdot 2 \cdot 3 \dots r}$.

Proof.—The expansion of $(x+a)^n$ is the product of n factors, each equal to $x+a$, and every term in the expansion is of n dimensions, being a product formed by multiplying together n letters, one taken from each of the n factors. Thus each term involving $a^r x^{n-r}$ is obtained by taking a out of any r of the factors, and x out of the remaining $n-r$ factors. So the number of terms involving $a^r x^{n-r}$ must equal the number of ways in which r things can be selected out of n , and by giving to r the values $0, 1, 2, 3, \dots, n$ in succession, we obtain the coefficients of all the terms.

By writing $-a$ for a in the above we get the expansion of $(x-a)^n$.

PERMUTATIONS AND COMBINATIONS.—The coefficients of the various terms in the expansion of $(x+a)^n$ give the number of combinations of n things taken $1, 2, 3, \dots$ at a time, a combination being a group or selection which can be made by taking some or all of the things considered.

A permutation is a linear arrangement. The number of permutations of n dissimilar things taken r at a time is denoted by nP_r , and it is easy to show that—

$${}^nP_r = n(n-1)(n-2)\dots(n-r+1).$$

Hence nP_n , the number of permutations of n things all at a time, is equal to—

$$n(n-1)(n-2)\dots 3 \cdot 2 \cdot 1,$$

which is written n or $n!$ and read as 'factorial n .' The number of combinations of n dissimilar things taken r at a time (nC_r) is quickly found from the formula for nP_r , for ${}^nC_r \times r!$ is the number of arrangements of n things r at a time.

$$\text{Hence } {}^nC_r = \frac{n(n-1)(n-2)\dots(n-r+1)}{r!}.$$

This subject is further dealt with in 'Combinatorial Analysis.'

SERIES.—The most frequently occurring series are arithmetical and geometrical progressions, and combinations of these. (i.) A series is in *arithmetical progression* when the terms increase or decrease by a common difference. The sum s of n terms of the series $a, a+d, a+2d, a+3d, \dots$ is given by $s = \frac{n}{2} \{2a + (n-1)d\}$. This result is easily obtained by writing the series in the reverse order and adding to the original series. (ii.) Quantities are in *geometrical progression* when they increase or decrease by a constant factor.

The sum of n terms of the series is obtained thus—

$$\text{Let } s = a + ar + ar^2 + \dots + ar^{n-2} + ar^{n-1}.$$

$$\text{Then } rs = ar + ar^2 + \dots + ar^{n-2} + ar^{n-1} + ar^n.$$

Whence, by subtraction, etc.—

$$s = \frac{a(r^n - 1)}{r - 1} \text{ or } \frac{a(1 - r^n)}{1 - r}.$$

The second of these is to be used in all cases except where r is positive and greater than 1. If r is less than 1, we have for the sum of an infinite number of terms of the series $s = \frac{a}{1-r}$, for the term $\frac{ar^n}{1-r}$ can be made as small as we please by making n large enough.

Recurring decimals furnish good examples of infinite geometrical progressions, e.g.—

$$0.32\bar{2} = 0.3 + \frac{25}{10^3} \left\{ 1 + \frac{1}{10} + \frac{1}{10^2} + \dots \right\}$$

$$= 0.3 + \frac{25}{10^3} \cdot \frac{1}{1 - \frac{1}{10}} = \frac{322}{990}.$$

The subject is further dealt with in *Series*.

HIGHER ALGEBRA.—It can be shown that the Binomial Theorem is valid when the index n has any value, integral or fractional, positive or negative. But it is only in certain cases that the expansion can be made of an expression such as $(1+x)^n$. A full consideration shows that the expansion has an intelligible arithmetical meaning only when x is less than 1 (see *SERIES*). Applications of the binomial theorem lead to the result—

$$a^x = 1 + x \log_e a + \frac{x^2 (\log_e a)^2}{2} + \frac{x^3 (\log_e a)^3}{3} + \dots$$

which is known as the *Exponential Theorem*, and further to the expansion—

$$\log_e (1+x) = x - \frac{x^2}{2} + \frac{x^3}{3} - \frac{x^4}{4} + \dots$$

which is the *Logarithmic Series*.

The number e is defined by the above expression for a^x , for on writing e for a , we have, when $x=1$,

$$e = 1 + 1 + \frac{1}{2} + \frac{1}{3} + \frac{1}{4} + \dots$$

This number is the base of the *Napierian* or *Natural* system of logarithms.

IMAGINARY AND COMPLEX QUANTITIES.—From the rule of signs it is obvious that a negative quantity cannot have a real square root, but *imaginary* expressions of the form $\sqrt{-a}$ occur frequently in the theory of equations, and their use leads to valuable results. Complex numbers are of the form $a + b\sqrt{-1}$, where a and b are real.

The interpretation of various theorems in the light of these conceptions leads to important developments in analytical trigonometry.

See (i.) *Elementary*: H. S. Hall and S. R. Knight, W. M. Baker, and A. A. Bourne; (ii.) *Advanced*: G. Chrystal, C. Smith; (iii.) *Special*: T. J. P.A. Bromwich, *Theory of Infinite Series*; H. S. Carslaw, *Theory of Fourier's Series*; W. R. Hamilton and C. J. Joly, *Elements of Quaternions*; A. N. Whitehead, *Universal Algebra*.

ALGECIRAS (36° 8' N., 5° 24' W.), seaport, Spain; in Moorish possession, VIII. to XIV. cent.; Brit. naval victory over Fr. and Span. fleets, July 12, 1801; International Morocco Conference held at A., 1906. Pop. 13,000.

ALGEMESI (39° 12' N., 0° 30' W.), small town, Spain; oranges.

ALGERIA (33° 55' N., 3° 30' E.) is the principal overseas possession of France and is situated in N. Africa; bounded N. by Mediterranean, E. by Tunisia. S. by Sahara, W. by Morocco; area, c. 195,000 sq. miles, or including Sahara, 1,120,000. Part of surface is occupied by plateau of Barbary, which separates the Little Atlas from the Great Atlas; in S. is the Sahara Desert. The undulating N. district which contains the Little Atlas is generally known as the Tell, and is the only part of the country which can be cultivated without irrigation. The S. desert region is divided into the Lower and Upper Sahara, the former a great clayey depression, the latter a rocky plateau; it contains innumerable oases producing dates, olives, etc. The principal river is the Shelif, which rises in the Sahara and flows to the Mediterranean; other rivers are the Issur, Zowah, Oued el Kebir, and Seybuse. There are many salt lakes, called Chotts, in the Sahara, largest being Chott-el-Chergui and Chott-el-Melghir. Capital, Algiers (q.v.). Climate is generally temperate in N., bracing on coast, hot in Sahara; sirocco blows in spring and summer.

History.—After having been conquered in turn by the Romans, Vandals, and Byzantines, A. was invaded by the Arabs in the VIII. cent., from which time dates the establishment of Islamism. The country was ruled by Arab princes till the XII. cent., and then for a time by the Almohades. The Moors settled here in late XV. cent., after they had been banished from Spain by Ferdinand the Catholic; they applied for aid against Spain to the pirate Barbarossa, who subsequently took possession of the country. After his defeat and death his bro. succeeded him, and A. became a Turk. province in 1519. Later in the same cent. great struggle took place between Spain and Turkey; but the defeat of Charles V. in 1541 ended this, and the Turks continued their career of piracy. In 1669 the Turk. gov. was banished by the corsairs, who then chose a dey for themselves, Turkey perforce acknowledging Algerian independence. From time to time attempts were made by various European powers to suppress the system of piracy carried on by the corsairs, who nevertheless continued to flourish until 1830. In that year the French sent an expedition against them and seized the town of Algiers, after which the whole country gradually came under Fr. control. A rising which broke out in 1864 was finally suppressed in 1871.

A. is administered by a gov. gen. who represents Fr. Republic and is assisted in matters of finance and taxation by a Superior Council and Delegations. There is also a consulting council. A. is divided for administrative purposes into three Provinces, the northern portions of which form the 'Departments' of Algeria, Oran, and Constantine (together making up the 'Northern Territory'); the southern portions being called the 'Southern Territory'. The three Departments are administered as an integral part of France, like Fr. departments, and each sends two deputies and a senator to Paris.

A. has great forests on the mountain slopes, containing oaks, cedars, junipers, and other trees. Cultivated plants include cereals, vast quantities of wheat, oats, and barley being grown in the Tell, flax and tobacco. Vines, olives, oranges, and other fruits are cultivated, and various vegetables grown. Olive oil is largely produced, and there are important fisheries, while horses, mules, cattle, and sheep are raised in large numbers. Minerals include iron, lead, copper, zinc, phosphates, salt, petroleum. Among exports are sheep, wool, hides, cereals, cattle, horses, fruit, olive

oil, metals, phosphates, tobacco; imports textiles, machinery, paper, coal, sugar, coffee, etc. Railway mileage is over 2000; good postal and telegraphic communications.

Inhabitants include French, Jews, Moroccans, etc. Pop. (1911) 5,500,000, of whom 750,000 were Europeans. Maurice Wahl, *L'Algérie* (1908); Simpson, *Algiers and Beyond*.

ALGHERO (40° 35' N., 8° 19' E.), seaport, Sardinia; cathedral. Pop. 10,779.

ALGIERS (36° 43' N., 3° E.), capital, Algeria, N. Africa; modern town along shore, ancient city on hill behind; good harbour. Principal public buildings: Kasbah (fortress), gov.'s and abp.'s palaces, Grand Mosque dating from XI. cent., New Mosque (from XVII. cent.), R.C. Cathedral; important coaling station and health resort; trades in wine and grain; court of appeal, observatory, univ., museum. A. was founded (X. cent.) by Arabs; headquarters of Barbary pirates from XVI. cent.; Emperor Charles V. attempted unsuccessfully to take city, 1541; often attacked by European nations; bombarded by British, 1816; taken by French, 1830. Pop. 154,000.

ALGIERS (29° 57' N., 90° W.), suburb of New Orleans, Louisiana, U.S.A.; shipyards.

ALGIN, the sodium salt of alginic acid, obtained by boiling seaweed with sodium carbonate solution; resembles gelatine, used as gum.

ALGOA BAY (33° 47' S., 25° 51' E.), bay, S. Africa; harbour, Port Elizabeth; Algoa means 'on the way to Goa' (q.v.), in India.

ALGOL, fixed star, β Persei, in Medusa's head, with a remarkable periodic fluctuation in brightness, which may be due to eclipses by a dark satellite. The brightness has been estimated as being seventy times that of the solar photosphere.

ALGOMA, town and district, W. Ontario; minerals, forests.

ALGONKIAN PERIOD, a group of widely distributed rocks, including all formations younger than archæan and older than paleozoic.

ALGONQUINS, remnant of great N. Amer. Indian family, which once occupied vast territory in Canada and U.S.A.

ALGUM, see *ALMUG*.

ALHAMA DE GRANADA (37° 4' N., 3° 57' W.), town, Spain; hot sulphur springs. Pop. 7679.

ALHAMBRA, THE ('red castle'), gorgeous palace of the ancient Moorish kings of Granada (Southern Spain); begun by Ibn-l-Ahmar (1248) and completed by Muhammad III. (1314). It is surrounded by a fortified wall, strengthened by defensive towers. The most magnificent parts remaining are the famous Hall of Ambassadors, Court of the Lions, and Court of the Fishpond. The scheme of decoration is carried out in the three primary colours, and the marvellously beautiful mosaic work, the elegant lightness of the arches and columns, and the elaborate richness of its ornamentation have served to make this ruined palace one of the wonders of the world, notwithstanding that it has suffered greatly from the effects of earthquake, from Fr. vandalism (s. 1811), and from the merciless hand of Time.

ALHAZEN, ALHASAN (XI. cent.), Arab. physicist; author of a treatise on optics; discovered that vision is not due to emission of rays by the eye, and explained phenomena of atmospheric refraction, such as the twilight.

ALHUCEMA ISLANDS (35° 17' N., 3° 45' W.), islands off coast of Morocco, North Africa.

ALI BEN ABU TALIB (d. 661 A.D.), cousin of Muhammad; succ. as Caliph, 656; m. the prophet's dau. Fatima; assassinated.

ALI PASHA (1741-1822), Albanian chief, surnamed Arslan 'the Lion.' His f., the Bey of Tepeleni, was murdered when A. was fourteen, and his territories seized. He eventually recovered his f.'s possessions, and gained the favour of the Porte; app. Pasha of Jannina (1788), he became one of the most influential

viziers under the Turk. rule. He was insatiably ambitious, and committed great enormities to further his ends. Having aroused the jealousy of the Sultan, Mahmud II., he was eventually assassinated. His court at Jannina attracted many travellers: Byron introduces him in *Child Harold's Pilgrimage*.

ALIAGA (15° 25' N., 120° 45' E.), town, Philippines; rice, tobacco. Pop. 11,950.

ALIAS (in full, *alias dictus*), legal term referring to a person who has assumed a false name.

ALIBI, in law, 'to prove an alibi' is to produce evidence that the person charged with a crime was in another place at the time it was committed.

ALICANTE (38° 32' N., 0° 35' W.), province, Spain; agriculture and viticulture. Pop. (1910) 484,000.

ALICANTE (38° 21' N., 0° 26' W.), capital, A. province, Spain; fortified harbour; manufactures cotton, linen, cigars. Pop. (1910) 51,000.

ALICE (32° 45' S., 26° 52' E.), town, Cape Province, S. Africa; near Lovedale mission station.

ALICE MAUD MARY, Grand-Duchess of Hesse-Darmstadt (1843-78), 2nd dau. of Queen Victoria; m. Grand Duke Louis IV., 1862; d. of diphtheria caught while nursing her dau. 'May'; a devoted and talented wife and mother.

ALIEN, person belonging to another country; one not entitled to rights of citizenship. In James I.'s reign it was held that natives of Scotland b. before the Union were aliens. Since the Naturalisation Act (1870) an a. may now become naturalised by applying to the Home Sec. and producing evidence of having lived in the U.K. for not less than five years. The Aliens Act (1905) makes it possible for immigration officers to prevent the landing in the U.K. of lunatics, idiots, or persons suffering from any disease or infirmity which renders them likely to become a charge upon the rates. They may also be excluded if they cannot show that they have in their possession, or are in a position to obtain, means of decently supporting themselves and their dependants; or if they have been expelled from the U.K., or have been sentenced for an extradition crime in a foreign country. The alien immigrants from Europe to the U.K. during the year 1910 numbered nearly half a million. See **NATURALISATION**.

ALIENATION, estrangement; in law, transference of property by deed; condition of insanity.

ALIEN-HOUSES, English religious houses controlled by foreign ecclesiastics, like Abbot of Cluny.

ALIENIST, psychiatrist, specialist in mental diseases. See **INSANITY**.

ALIGARH (27° 55' N., 78° 6' E.), town, United Provinces, India; Muhammanadan Coll. Pop. (1911) 65,000.

ALIGNMENT, term used in archaeology, engineering, military matters, etc., meaning an arrangement in line. It is applied to a row of monoliths; a railway ground plan; a military formation; and in several other ways.

(1° 30' S., 10° E.), navigable tributary of Congo, Africa.

ALIMENT, an allowance for maintenance (Scots law); used synonymously with alimony (*q.v.*).

ALIMENTARY CANAL, see **DIGESTION**.

ALIMONY.—On the commencement of divorce proceedings it is usual for the wife to apply for an order on her husband for maintenance during and after the suit. The former is called *alimony pendente lite*, and continues until the *decree absolute*; the latter, *permanent alimony*. An order will not be made where the husband has little or no means, and if he is destitute and his wife has means, he may apply for an order on her.

ALIN, OSCAR JOSEPH (1846-1900), Swed. historian; prof. of Political Economy at Upsala; many works on history of Sweden.

ALIPHATIC, name applied to organic compounds such as the fatty acids and other derivatives of the

methane series and unsaturated compounds like the acetylene and ethylene series.

ALICUOT PART, or submultiple, a quantity dividing another quantity without a remainder; thus, 7 is an a. p. of 21.

ALIRAJPUR (22° N., 74° E.), native state, India; 836 sq. miles. Pop. 50,000.

ALISMACEÆ, order of monocotyledonous water- and marsh-plants, including about 70 species, e.g. the water plantain (*Alisma Plantago*), flowering rush (*Butomus*), and arrow-head (*Sagittaria*), which occur in Britain.

ALISON, ARCHIBALD (1757-1839), Scot. episcopal clergyman and author; s. of Lord Provost of Edinburgh; wrote *Nature and Principles of Taste* (1790), etc. His e. s., William Pulteney A. (1790-1859), was prof. of Medicine in Edinburgh University (1822-58); 2nd s., Sir Archibald A., Bart. (1792-1867), was a distinguished historian and legal writer; Lord Rector of Glasgow University (1851); created a baronet (1852); wrote *History of Europe* (10 vols., 1833-42) and (9 vols., 1852-59) *Lives of Marlborough, Castlereagh, and others*; *Principles of Population, Principles of the Criminal Law of Scotland*, etc. Sir Archibald A., 2nd Bart. (1826-1907), s. of the last-named, was a distinguished Brit. general; served in the Indian Mutiny, Ashanti War, and Egyptian War (1882-83).

ALI WAL (31° N., 75° 31' E.), village, India; Sikhs defeated by Sir Harry Smith, 1846.

ALI WAL NORTH (30° 55' S., 26° 53' E.), town, and district, Cape Province, S. Africa; sulphur springs. District pop. (1911) 16,000 (7000 white).

ALIZARIN (C₁₅H₈(CO)₂C₆H₃(OH)₂[1.2.]), dyestuff formerly prepared from madder root, now synthetically from anthracene; crystallises in red prisms, M.P. 290°, produces Turkey reds, purpurin, and other dyes (*q.v.*) with different mordants.

ALJUBARROTA (39° 35' N., 8° 55' W.), town, Estremadura, Portugal; by defeat of Castilians, 1385, Portugal gained independence.

ALKAHEST, the imaginary 'universal solvent' of the alchemists.

ALKALI, a chemical compound, such as soda and potash and the caustic hydroxides of the 'alkali metals,' sodium, potassium, lithium, cesium, rubidium, having the property of neutralising an acid. A's turn a red litmus solution blue and phenolphthalein red.

Manufacture.—The term a. was originally employed for the ashes of vegetable substances which had a soapy feel when dissolved in water, and is now applied particularly to the hydroxide (caustic soda) and carbonate of sodium. The latter is manufactured by three different methods. The *Leblanc process* essentially consists of three stages: (a) The formation of salt-cake (sodium sulphate) and hydrochloric acid by heating common salt and sulphuric acid in iron pots in furnaces of varying construction. The hydrochloric acid is condensed in coke-towers or stoneware receivers and afterwards used in the manufacture of chlorine and bleaching-powder. (b) The salt-cake is mixed with an equal quantity of limestone or chalk and two-thirds of slack and heated in a revolving furnace, forming 'black ash' which contains sodium carbonate, calcium sulphate, and impurities. (c) The black ash is leached with water and the soda crystallised out by boiling down the liquor, washing soda, refined soda, and soda ash or a. (Na₂CO₃), being the three grades of strength (i.e. percentage of carbonate) obtained. Caustic soda (NaOH) is manufactured from the liquor by boiling it with slaked lime and solidifying the caustic after filtering it from the chalk deposit. Except as regards the manufacture of chlorine the *ammonia-soda or solvay process* is much more efficient and economical than the Leblanc process, and has largely superseded it. Purified brine (NaCl solution) is saturated with ammonia and then with carbon dioxide which is brought into contact with the ammoniacal salt solution in a 'solvay' tower.

Ammonium bicarbonate results, which acts on the salt solution to form sodium bicarbonate and ammonium chloride. The crystals of sodium bicarbonate are filtered and dried, and by heating converted into soda and carbon dioxide. The latter is used again in the carbonating tower, while ammonia is recovered from the ammonium chloride solution by heating it with milk of lime (CaOH). The manufacture of caustic a's is best carried on by one of the *electrolytic processes*. If an electric current be passed through a solution of common salt, sodium and chlorine are formed; the former immediately reacting with the water gives rise to the hydroxide (caustic soda solution). The chlorine can either be collected or made to act within the liquid to form bleach-liquors or, at a higher concentration and temperature, sodium chlorate. This process holds good for the corresponding potassium salts.

Alkalimetry, the estimation of alkalis by titrating their solutions with standard acid.

G. Lunge, *Sulphuric Acid and Alkali Manufacture*, 1902; Lomas, *Manual of the Alkali Trade*.

ALKALINE EARTHS, originally, the oxides of barium, calcium, magnesium, strontium, and beryllium; the term is frequently applied to the metals themselves. The chlorides and nitrates are soluble in water, while the carbonates, sulphates, and phosphates are usually insoluble.

ALKALOID, a basic vegetable substance with poisonous and medicinal properties, considered chemically as a derivative of quinoline, isoquinoline, or pyridine. The more important a's are: nicotine, atropine, cocaine, eugonine, strychnine, brucine, veratrine, morphine, papaverine, codeine, etc.

ALKAN, **CHARLES HENRI VALENTIN MORHANGE** (1813-88), Fr. musician and composer.

ALKANNA, **ALKANNT**, boraginaceous plant, also known as bugloss or orcanet in Mediterranean countries, the roots of which yield red colouring matter.

AL KASR AL KEBIR (34° 59' N., 5° 50' W.), town, Morocco. Pop. c. 10,000.

AL-KENDI, see **ARABIAN PHILOSOPHY**.

AL-KINDI, see **ALCINDUS**.

ALKMAAR (52° 39' N., 4° 47' E.), port, Holland; cheese trade centre. Pop. (1910) 20,500.—**Alkmaar**, Convention of, treaty (1799) by which Anglo-Russian army, under Duke of York, evacuated Netherlands.

ALKYL, any aliphatic radical such as methyl, ethyl, propyl, aryl, etc., which in organic compounds behave somewhat similar to the metals in inorganic compounds.

ALL FOOLS' DAY, no satisfactory explanation of the term is known, but it has long been a popular custom in England and other countries to attempt to make fools of one's acquaintances on April 1. The 'April fool' in Scotland is called a 'gowk,' in France a *poisson d'Avril*, in Germany, *April-narr*.

ALL SAINTS, FESTIVAL OF, is observed in the Catholic Church on Nov. 1. Its origin is uncertain. All Martyrs and Saints were commemorated the Sunday after Pentecost at Antioch in the IV. cent. At Rome, on May 13, the festival of the Blessed Virgin and the Martyrs was celebrated by order of Boniface IV. in 609 or 610, but the modern commemoration probably does not arise from this but rather from the consecration of a chapel in St. Peter's for the apostles, saints, martyrs, and confessors in 731. Its observance in the West has been general since c. 800, and it was made a feast of obligation by Gregory IV. in 835. It is observed in the Church of England (though that of All Souls on Nov. 2 is not). Most Prot. Churches do not observe it, though it was formally in the Lutheran calendar.

ALL SOULS' DAY, feast to commemorate all faithful dead, celebrated by R.C. Church on Nov. 2; feast of general intercession instituted in XI. cent.

ALLACCI, LEONE, **LEO ALLATIUS** (1586-1669), Gk. theologian and scholar; librarian of the Vatican.

ALLADA (6° 30' N., 2° 10' E.), town, Dahomey, W. Africa; ancient capital. Pop. 10,000.

ALLAH, Arabic term for God, used by Muslims. See **MUHAMMADANISM**.

ALLAHABAD (25° 26' N., 81° 50' E.), capital, United Provinces, India; at confluence of Jumna and Ganges; fort built by Akbar, 1575; univ.; great annual fair and centre of pilgrimage. Pop. (1911) 172,000.—**ALLAHABAD** (25° 45' N., 80° 15' E.), district; produces grain, cotton. Pop. 1,489,358.

ALLAMANDA, genus of tropical Amer. evergreen climbing shrubs, order *Apocynaceae*, with large funnel-shaped yellow or purple flowers and leaves arranged in whorls; cultivated in hothouses.

ALLAN, DAVID (1744-96), Scot. artist; illustrated *Gentle Shepherd*; called the 'Scottish Hogarth.'

ALLAN, SIR HUGH (1810-82), Scots-Canadian financier; organised Allan Line of steamships between Montreal, Liverpool, and Glasgow.

ALLAN, SIR WILLIAM, A.R.A. (1782-1850), Scot. hist. painter; b. Edinburgh; painted *John Knox admonishing Mary Queen of Scots* (1823); *Mary Q. of Scots signing her Abdication* (1824); portraits of Scott and Byron.

ALLANTOIN ($\text{C}_4\text{H}_8\text{O}_3\text{N}_2$), crystalline oxidation product of uric acid, found in the allantoin liquid of the cow.

ALLARIZ (42° 10' N., 7° 45' W.), walled town, Orense, Spain.

ALLEGHANY, THE ALLEGHANIES (38° 10' N., 80° W.), mountains, Pennsylvania, Maryland, and Virginia. See **APPALACHIANS**.

ALLEGHENY (40° 30' N., 80° W.), part of Pittsburgh, Pennsylvania; univ. and observatory; great manufacturing centre; meat packing, pickles, and preserves, iron foundries. Pop. (1910) 145,000.

ALLEGHENY, river rising Potter Co., Pa., U.S.A.; joins Monongahela at Pittsburgh, forming Ohio.

ALLEGIANCE, the duty which a subject owes to his Sovereign, or liege. Until the passing of the Naturalisation Act (1870) Brit. subjects could not renounce their a. Self-expatriation in the U.S. has long been allowed.

ALLEGORY is an extended metaphor. Notable examples of the a. are Spenser's *Faerie Queen* and Bunyan's *Pilgrim's Progress*.

ALLEGRI, GREGORIO (b. abt. 1560), Ital. priest and composer; one of earliest writers for stringed instruments; famous setting of the *Miserere*.

ALLEGRO (mus. term), quick, lively time; name of piece of music; also of movement in a composition. *Allegretto* is diminutive of a., and denotes somewhat slower movement.

ALLEINE, JOSEPH (1684-68), Nonconformist divine, held in much veneration; ejected from his pulpit, he suffered terms of imprisonment for itinerant preaching; wrote *Sure Guide to Heaven*.

ALLEINE, RICHARD (1611-81), Puritan divine; wrote *The Godly Man's Portion* (1663); *Heaven Opened* (1668); *The World Conquered* (1668).

ALLELUIA, see **Hallelujah**.

ALLEMANDE, a Ger. national dance; a movement in musical suites.

ALLEN, BOG OF, series of bogs, Kildare, King's County, Queen's County, Westmeath, Ireland.

ALLEN, ETHAN (1739-89), Amer. soldier; took part in taking of Ticonderoga (1775); captured during raid in Canada; wrote *Narrative of Colonel Ethan Allen's Captivity* (1779).

ALLEN, GRANT (1848-99), Canadian scientific author and novelist; wrote *The Evolutionist at Large* (1881); *The Evolution of the Idea of God* (1897); *The Woman who Did* (1895); and many other novels.

ALLEN, JAMES LANE (1849-), Amer. novelist; author of about ten novels, of which *The Choir Invisible* (1897) is best known.

ALLEN, JOHN (1771-1843), Brit. author; wrote *Rise and Growth of the Royal Prerogative in England* (1830); frequent contributor to *Edinburgh Review*; master of Dulwich Coll.

ALLEN, RALPH (1694-1764), Eng. philanthropist; friend of Fielding and Pope.

ALLEN, THOMAS, ALLEYN (1542-1632), Eng. mathematician, collector of rare scientific manuscripts which were afterwards presented to the Bodleian Library.

ALLEN, WILLIAM (1532-94), Eng. cardinal; canon of York during Mary's reign; established a coll. at Douai (1568) for training of R.C. priests, and became closely associated with Jesuits; strongly encouraged Philip II. to invade England, and was promised the highest offices if the project succeeded; made cardinal by Sixtus V. (1587); after the Armada's failure A. passed into obscurity.

ALLEN, WILLIAM FRANCIS (1830-89), Amer. scholar; text-books on classical lit.; edited *Collection of Slave Songs* (1867).

ALLENSTEIN (53° 46' N., 20° 26' E.), town, Prussia; iron foundries. Pop. 27,500.

ALLENTOWN (40° 36' N., 75° 27' W.), town, Pennsylvania; two colleges; iron foundries, silk. Pop. (1910) 51,913.

ALLEPPEY, ALLEPPI (9° 29' N., 76° 14' E.), seaport, Travancore, India. Pop. 25,000.

ALLERION, heraldic figure of an eagle, or eaglet, with wings outspread, but lacking beak and claws.

ALLETREE, RICHARD (1619-81), Eng. divine; fought on Royalist side at Edgehill (1642); after war became univ. tutor; canon of Christ Church (1660); regius prof. of Divinity (1663); provost of Eton (1665), in which position was very successful.

ALLEYN, EDWARD (1566-1626), Eng. actor; s. of innkeeper; foremost actor of his time; received warm praise from Ben Jonson; had large holdings in theatres; founded Dulwich Coll., where his portrait hangs.

ALL-HALLOW, see **ALL SAINTS' DAY**.

ALLIA, eastern tributary of Tiber, Italy; Gauls under Brennus defeated Romans, 390 B.C.

ALLIACEOUS PLANTS, those of genus **ALLIUM** (q.v.).

ALLIANCE, an act of combination between States, parties, and others, for their general defence or benefit. Notable examples of international a's have been: The Triple Alliance (1688) between Gt. Britain, the Netherlands, and Sweden against Louis XIV.; the Grand Alliance (1689); the Quadruple Alliance (1814) directed against the power of Napoleon; the Holy Alliance (q.v.) between Russia, Austria, and Prussia (1815); the Triple Alliance (1872) organised by Bismarck between Germany, Austria, and Russia, from which Russia withdrew in 1886, its place being taken by Italy; and the Balkan Alliance (Bulgaria, Servia, Greece, and Montenegro), 1912.

ALLIANCE (40° 56' N., 81° 6' W.), town, Ohio; iron manufactures. Pop. (1910) 15,083.

ALLIARIA, genus of cruciferous white-flowered biennial plants; *sisymbrium* a. or *A. officinalis* is popularly known as Jack-by-the-hedge or sauce-alone.

ALLIBONE, SAMUEL AUSTIN (1816-89), Amer. author; compiled *Critical Dictionary of English Literature*, 1854-71.

ALLIER (46° 45' N., 3° 5' E.), river, France; joins Loire.

ALLIER (46° 23' N., 3° 10' E.), department, France; fertile plains, with forests in N.; agriculture highly developed; coal and manganese mines; capital, Moulins. Pop. (1911) 406,000.

ALLIES, THE, the Confederate Powers (Britain, Russia, Prussia, Austria, etc.) who restored the Bourbons in France (1814-15).

ALLIES, THOMAS WILLIAM (1813-1903), Eng. hist. writer; Church of England clergyman for many years; became R.C. (1850); chief work, *The Formation of Christendom* (1865-95).

ALLIGATION, arith. rule for finding price of a mixture given the price of its ingredients; or for finding the amounts of ingredients at given prices to be mixed to produce a mixture of given price.

ALLIGATOR, animal living in Amer. rivers, resembling the crocodile (q.v.) except in having a

more stumpy head and the fourth tooth of the lower jaw fitting into a pit, not a notch, in the upper jaw. The largest a., attaining a length of 20 ft., is the caiman of the Amazon. The small *A. sinensis* occurs in Chin. rivers.

ALLIGATOR FISH, found in N. Pacific, is covered with hard overlapping plates; European variety is the Sea Poacher.

ALLINGHAM, HELEN, née PATERSON (1848-), Eng. painter; rural scenes; wife of W. A. (q.v.).

ALLINGHAM, WILLIAM (1824-89), poet and journalist; b. Ireland; *Day and Night Songs* (1855), *Lawrence Bloomfield in Ireland* (1864); edited *Fraser's Magazine*.

ALLITERATION, in prosody, is the recurrence of words or syllables beginning with the same letter, as in the well-known line, 'By apt alliteration's artful aid' (Churchill). Anglo-Saxon and Icelandic poetry were entirely alliterative, and Langland's *Vision of Piers Plowman* is of the same character. It did not fall into general disuse until about the middle of the XIV. cent., and still occurs. Tennyson has: 'his heavy-shotted, hammock-shroud,' and Swinburne used it often to great effect.

ALLIUM, genus of bulbous plants of the order *Liliacea* with flowers in dense heads or umbels, including onion, leek, garlic, chives, shallot, etc.

ALLMAN, GEORGE JAMES (1812-98), Irish biologist, prof. of Bot., Dublin Univ. (1844-56); afterwards regius prof. of Natural History, Edinburgh; known for monograph on gymneblastic hydroids and introduction of the terms *ectoderm* and *ectoderm*; pres. of the Linnæan Society, and of the Brit. Association (1879).

ALLMERS, HERMAN (1821-1902), Ger. poet and writer; collected works—lyric, dramatic, narrative, etc.—pub. in 6 vols., 1891-95.

ALLOA (56° 7' N., 3° 48' W.), town, Scotland; yarn factories, breweries, distilleries, brass, pottery, and glass works; exports coal. Pop. 11,803.

ALLOBROGES, a Celtic tribe occupying what is now Dauphiné and Savoy; took part with Hannibal in invasion of Italy.

ALLOCUATION, formal address of Pope to cardinals and clergy.

ALLODIUM, early form of land tenure in which the property was held entirely free of any feudal superior. The system still obtains in Shetland and Orkney.

ALLOMERISM (chem. and min.), property of changing chemical constitution without variation in crystalline form.

ALLON, HENRY (1818-92), Eng. Nonconformist divine; editor, *British Quarterly Review*; associated with Gladstone, Arnold, Maurice, and Dean Stanley.

ALLONG, HALONG (20° 58' N., 107° E.), bay, Gulf of Tong-King.

ALLOPHANE (Al₂SiO₅·5H₂O), amorphous glassy mineral of various colours, decomposition product of various silicates, such as felspar, occurring in fissures of ore-bearing and other rocks.

ALLORI, ALESSANDRO, BRONZINO (1535-1607), portrait painter of Florentine school; f. of **CHRISTOFANO A.** (1577-1621), portrait and altar painter; fine *Judith with Head of Holofernes*.

ALLOTMENTS, see **SMALL HOLDINGS**.

ALLOTROPY (chem.), the faculty of existing in several conditions with different properties, e.g. carbon occurs as diamond and graphite as well as in an amorphous condition. Different forms of organic substances of the same constituents are termed *isomeric*.

ALLOWAY (56° 26' N., 4° 39' W.), hamlet, on Doon, Ayrshire, Scotland; birthplace of Burns; famous 'haunted kirk' and 'Auld Brig'; Burns' cottage and monument.

ALLOKAN, MESOKALYL URRA (C₄H₂O₂N₂), crystalline oxidation product of uric acid.

ALLOXURIC BASES, in physiological chem., substances containing the radicals alloxan and urea, such as adenine, xanthine, guanine, and other derivatives of purine.

ALLOYS, substances with metallic properties formed by the intimate union, usually by fusion, of different metals in varying proportions, or of a metal and a non-metal. They are more fusible and harder, but less malleable and inferior conductors of electricity than their components. Modern metallographical methods, especially aided by microphotography, show that most alloys must be regarded as solid solutions of the constituents in each other, or as conglomerations of the simple constituents and their chemical compounds. The better-known a's are: *bronzes*, *gun-metal* (copper and tin), *brass* (copper and zinc, sometimes with tin), *steel* (iron and carbon, with nickel, chromium, tungsten, etc.), *type-metal* (lead and antimony, often with tin, copper, or nickel), *pewter* (tin with a little copper), *German silver* (copper, zinc, and nickel), *Britannia metal* (tin, antimony, and copper), *magnalium* (aluminium and magnesium). A's of mercury are called *amalgams*.

ALLPORT, SIR JAMES JOSEPH (1811-92), Eng. railway manager; for 27 years manager of the Midland Railway; improved passenger accommodation and cheapened fares; introduced Pullman car on Brit. railways.

ALLPORT, SAMUEL (1816-97), Eng. geologist, bro. of above; one of pioneers of microscopic petrology.

'**ALL-RED**' ROUTE is the name given to a proposed accelerated service to New Zealand and Australia, via Canada, brought forward by Sir Wilfred Laurier at the Imperial Conference (1907). It was contended that, besides the advantages of a quicker carriage of passengers and mails, it would result in securing a considerable amount of Canadian traffic which now goes by New York; it would give Gt. Britain the control of the Pacific trade; would strengthen her position both in the Atlantic and Pacific; and would furnish a means of protecting her trade in time of war. It was at first stated that the subsidy required would be £400,000; but this estimate was later increased to £1,000,000. The proposed subsidy would be provided jointly by Gt. Britain, Canada, New Zealand, and Australia. At the Imperial Conference (1911) an attempt to carry the proposal was unsuccessful. Mr. Asquith remarked that the opening of the Panama Canal might affect the scheme; while Mr. Lloyd George suggested that the difficulties in the way were almost insuperable, and suggested reference to the Royal Commission on Imperial Trade.

ALLSTON, WASHINGTON (1779-1843), Amer. poet and artist; became intimate with S. T. Coleridge, whose portrait he painted (National Gallery); pictures chiefly on religious subjects.

ALLUVION, the gradual formation and extension of land by action of water.

ALLUVIUM, soil deposited by running water. The deltas of rivers like the Mississippi, Nile, Ganges, Hwang-Ho, consist of a. Alluvial soils are extremely fertile, while some contain gem-stones or gold.

ALLYL ALCOHOL ($\text{CH}_3\text{CH}_2\text{CH}_2\text{OH}$), colourless, volatile, pungent liquid, B.P. 97°, occurring in wood spirit. It oxidises into glycerin.

ALMA (44° 45' N., 33° 30' E.), river, Crimea, Russia; enters Black Sea; gave name to Russ. defeat by Fr. and Brit. allies in Crimean War, 1854.

ALMA MATER ('kindly mother'), term applied by Romans to goddesses, Ceres, Cybele, etc.; by students to their univ. or college.

ALMACK'S, suite of assembly rooms, built in 1765, by a tavern-keeper in King St., St. James's. Admission to the dances and other functions held there was a mark of high social rank. The place was afterwards known as 'Willis's Rooms'; closed, 1890.

ALMADA (38° 40' N., 9° 10' W.), small town, Estremadura, Portugal.

ALMADEN, **ALMADEN DEL AZOGUE** (38° 47' N., 4° 47' W.), town, Spain; quicksilver mines. Pop. 7375. **ALMAGEST**, Arab name for great astronomical work of Claudius Ptolemy (q.v.).

ALMAGRO (38° 55' N., 3° 44' W.), town, Ciudad Real, Spain; lace.

ALMAGRO, DIEGO D' (1475-1538), Span. military adventurer; leading member of the Darien colony; was associated with Pizarro in scheme for conquest of Peru; subsequently coming into conflict with Pizarro, he was captured and put to death.

ALMANAC, tables or books containing a calendar, together with astronomical and statistical data, such as the times of the rising and setting of the sun and moon, of eclipses and the tides, and market days, terms of courts, ecclesiastical and other holidays, economic statistics of different countries, also genealogical and literary matter, etc. Many a's contain prophecies as to meteorological phenomena and political events. Primitive a's were compiled by the ancients, but the earliest manuscript a. probably originated in the XII. cent. Among modern Eng. a's, some of which show an interesting development from older astrological calendars, are *Old Moore's A.*, the *British A.*, *Whitaker's A.*; *Ephemeris* and *Nautical A.* issued by the chief governments.

ALMANDITE, **ALMANDINE**, gem-stone, deep red to purple, a kind of garnet; found in Ceylon, Australia (at first mistaken for rubies), N. America, and Tyrol.

ALMANSA (38° 53' N., 1° 4' W.), town, Albacete, Spain. Pop. 11,000.

ALMANSUR (fl. 754-775), second caliph of Abbasides dynasty; of a cruel and treacherous nature, but a patron of learning; persecuted the Egyptian and Syrian Christians; had Euclid's *Elements* trans. into Syriac.

ALMANZA, see **BERWICK, JAMES FITZ-JAMES**.

ALMAS (46° 8' N., 19° 21' E.), town, Bacsodrog, Hungary.

ALMA-TADEMA, SIR LAWRENCE (1836-1912), naturalised Brit. artist; b. Dronrip, Netherlands; studied at Antwerp; subjects taken largely from classical and mediæval sources; also many portraits; A.R.A. (1876); R.A. (1879); knighted (1899); O.M. (1905).

ALMEIDA (40° 44' N., 6° 57' W.), town, Portugal; old fortress.

ALMEIDA, DOM FRANCISCO DE (c. 1450-1510), Portug. Viceroy of the Indies; fought against the Moors for Ferdinand and Isabella; superseded in India by Albuquerque (q.v.); killed by natives at Table [Saldanha] Bay. His a. Lorenzo discovered Madagascar.

ALMEIDA-GARRET, JOÃO BAPTISTA DA LEITÃO D' (1799-1854), Portug. dramatist, poet, and statesman.

ALMEIRIM (39° 12' N., 8° 27' W.), small town, Santarem, Portugal; wine.

ALMELO (52° 22' N., 6° 40' E.), town, Holland; manufactures damask. Pop. 10,000.

ALMENDRALEJO (38° 42' N., 6° 22' W.), town, Spain. Pop. 12,500.

ALMERIA (37° 17' N., 2° 25' W.), province, Spain; area, 3360 sq. miles; silk, grapes; iron and lead mines. Pop. (1910) 354,000.

ALMERIA (36° 51' N., 2° 31' W.), cathedral town and seaport, Spain; formerly flourishing Moorish town and pirate headquarters; exports fruit. Pop. (1910) 45,000.

ALMISSA (43° 28' N., 16° 41' E.), seaport, Dalmatia, Austria; wine.

ALMODOVAR DEL CAMPO (38° 43' N., 4° 9' W.), town, Spain; mining centre. Pop. 12,500.

ALMOGÁVARES (c. XIII. and XIV. cent's), Span. frontier soldiers of hardy, reckless character; wore no armour, and carried javelin, sword, and shield.

ALMOHADES, name given to line of Muhammadan princes, started by Muhammad ibn Tumart in XII.

cent., in revolt from current Muhammadan anthropomorphism. After his death, 1128, the movement was carried on by 'Abd-el-Mumîn. The A. conquered Spain and N. Africa, and lasted till XIII. cent.

ALMON, JOHN (1737-1805), Eng. political pamphleteer and publisher; did much to secure freedom of the Press; his sentence by Lord Mansfield to pay a fine inspired one of the letters of 'Junius'; edited *Wilkes' Correspondence*, with *Memoir* (1805); published edition of 'letters' of Junius, 1806.

ALMOND (*Amygdalus communis*), small tree closely allied to plum, cherry, and peach, the pulpy exocarp of the latter fruits being replaced by a tough dry coat, the kernel representing the stone or seed. Bitter, Jordan a's, and other varieties have developed from the same species. Both the sweet and the bitter a's contain a fixed oil and a ferment emulsion which acts on the glucoside amygdalin to form prussic acid. The chief medicinal value of a's is that they may be converted into flour for palatable cakes, replacing starchy food in cases of diabetes.

ALMOND.—(1) (55° 58' N., 3° 27' W.) river, enters Firth of Forth, Orkney, Scotland. (2) (56° 28' N., 3° 38' W.) river, joins Tay near Perth, Scotland.

ALMONDBURY (53° 38' N., 1° 45' W.), town, West Riding, Yorkshire. Pop. (1911) 24,734.

ALMONER, officer in an almshouse; a title of dignity in old Fr. court. In England now there is a hereditary Grand A., lord high a., sub-a. Almonry, place in church or elsewhere where alms were given. The royal a. in England is an official of King's household.

ALMONTE (37° 15' N., 6° 35' W.), small town, Huelva, Spain.

ALMONTE (45° 15' N., 76° 15' W.), town, County Lanark, Ontario; iron works, factories.

ALMORA (29° 36' N., 79° 37' E.), town, United Provinces, India. Pop. 8596.—**ALMORA**, district, produces tea. Pop. 465,893.

ALMORAVIDES, Berber tribe from the Sahara, which reigned over N. Africa and Southern Spain during XI. and XII. cent's; they conquered the kingdom of Morocco; Ibn Tashfin was one of their most noted chiefs.

ALMQVIST, KARL JONAS LUDWIG (1793-1866), Swed. writer; pub. many novels, poems, and educational treatises; of very unstable character; charged with forgery and murder (1851), and fled to America. Wrote series of novels, *The Book of the Thorn-Rose* (1832-35).

ALMS (Gk. *eleimosynê*, 'mercy'), gift to the poor. Adjective, 'eleemosynary'.—**Alms**house, a place for the aged poor, generally endowed.

ALMUCANTAR (astron.), circle of altitude parallel to the horizon; instrument for observing heavenly bodies crossing a certain a.

ALMUCE, AMICE, a cap, sometimes with hood attached, worn by clergy as a choir vestment in the Middle Ages; it is now only worn on a few days; to be distinguished from the liturgical amice, worn as a mass vestment.

ALMUG, ALGUM, tree with valuable wood supposed to be red sandal-wood, mentioned in 1 *Kings* 10¹¹⁻¹², and 2 *Chron.* 2⁹, 9¹⁰⁻¹¹.

ALMUNECA (38° 45' N., 3° 46' W.), seaport town, Granada, Spain; sugar, fruit. Pop. 8000.

ALNWICK (55° 24' N., 1° 43' W.), town, Northumberland; early became borough and market town; old gateway and Norman arch; often besieged by Scots, XI.-XV. cent's; castle held six cent's by Percies (q.v.); breweries, tobacco trade. Pop. 7041.

ALOAE, ALOMÆ, the giants Otus and Ephialtes (twin sons of Poseidon and Iphimedia), who tried to pile Mt. Pelion upon Olympus; their reputed f. was Alox.

ALOE, genus of African plants, order *Liliaceae*, with a rosette of large juicy pointed spine-margined leaves, cultivated as ornamental plants. Preparations of the juice are used medicinally as a purgative and

an emmenagogue. Its principle is aloin (C₁₅H₁₈O₃H₂O).

ALOPECIA (Gk. *alopez*, a fox), baldness (q.v.); foxes being subject to loss of hair.

ALOPECURUS, foxtail (q.v.), a kind of grass.

ALORA (36° 49' N., 4° 40' W.), town, Spain; hot sulphur springs. Pop. 10,000.

ALOSNO (37° 32' N., 7° 9' W.), town, Huelva, Spain; copper mines.

ALOST, AALST (50° 57' N., 4° 3' E.), town, Belgium; hops, linen. Pop. (1910) 34,000.

ALOYSIA, see **VERBENA**.

ALOYSIUS, ST., see **GONZAGA, LUIGI**.

ALP ARSLAN ('brave lion'), or **MUHAMMAD BEN DA'UD** (1029-72), 2nd Sultan of Seljuk dynasty; through brilliant military operations made himself sole ruler of Persia, and extended his dominions in various parts of Asia.

ALPACA, breed of camel-like ungulates, like the llama and vicuña, probably derived from the guanaco, with fine long, woolly hair, domesticated in Peru and Bolivia. The name is applied both to the hair and the cloth manufactured from it. The latter often contains silk or cotton, and much of the fabric sold as a. is mohair.

ALPENA (45° 4' N., 83° 27' W.), town, Michigan. Pop. (1910) 12,716.

ALPES MARITIMES (43° 49' N., 7° 10' E.), department, France; area, 1482 sq. miles; Fr. Riviera; many health resorts—Nice, Cannes, etc.; produces fruit. Pop. (1911) 356,338.

ALPHA (chem.), first of group of compounds; (astron.), prefixed to Constellation, one of brightest stars therein.

ALPHA and **OMEGA**, the first and the last letters of Gk. alphabet.

ALPHA RAYS, see **RADIOACTIVITY**.

ALPHABET, term applied to collection of symbols used to express various sounds that occur in a language. It is derived from *alpha beta*, the two first letters of the Gk. language. There can be no doubt that pictures were first employed to indicate words; that these pictures became indistinct with the lapse of time, and that at a later period the sounds of words were reduced to their simplest forms or symbols. Even at the present day some languages have symbols only for words—the Chinese, for example. The Egyptian hieroglyphics were also pictorial, and indicated words. Whatever people the a. may have originated with, there can be little doubt that it evolved a form much as we now know it with the Phœnicians, and passed from them to the Greeks. The earliest alphabetic evidence to which a date can be assigned belongs to the earlier part of the IX. cent. B.C. This is the 'Moabite Stone,' recording the exploits of Mesha, King of Moab. It was discovered in 1868, and is now in the Louvre.

The Phœnician names given to the letters were not representative of the sounds, and these names were adopted by the Greeks. The Romans appear to have been the first to name the letters from the sounds. The vowels they called *a, e, i, o, u*. To *f, l, m, n, r, s, x*, they prefixed the *s* sound, and added the vowel *e* to *c, g, p, b, t, d*. The Anglo-Saxons had now obsolete letters *th* (q.v.) and *þ* ('th'; called 'thorn').

'AL-PHASI, ISAAC (1013-1103), Jewish rabbi; wrote *Halakhoth or Decisions*, a digest of the Talmud.

ALPHEGE, ÆLFHEAH, St. (954-1023), abp. of Canterbury, 1006; killed by Danes.

ALPHEUS (37° 35' N., 21° 52' E.), river, Peloponnese; flows into Ionian Sea; in Gk. myth. A. was a river god who pursued Arethusa (q.v.).

ALPHONSE, Count of Toulouse and Poitiers (1220-71); brother of 'St. Louis'; s. of Louis VIII.

ALPHONSINE TABLES, astronomical tables drawn up under superintendence of Alfonso X. of Castile (1226-84).

ALPHONSO, see **ALFONSO**.

ALPHONSUS A SANCTA MARIA, ALPHONSO

DE CARTAGENA (1396-1456), Span. historian; wrote history of Spain down to his own times.

ALPHONSUS, ST., see **LIGUORI**, **ALPHONSO DE**.

ALPINE CLUB, London, founded, 1857, for organization of Alpine climbing; *Alpine Journal* started, 1863, followed by clubs in Germany, Austria (amalgamated, 1874), Italy, Switzerland, France, and U.S.A.

ALPINI, PROSPERO (1553-1617), Ital. botanist; practised med.; for some time physician to Andrea Doria; prof. of Bot. at Padua from 1593; studied the flora of Egypt and discovered the bisexual nature of date-palms and other plants.

ALPS (46° N., 7° E.), crescent-shaped mountain system, N. Italy, Switzerland, France, Bavaria, Austria, Bosnia; total length, c. 700 miles; width, 30-160 miles; area, c. 80,000 sq. miles; divided according to height into *Fore A.*, *Middle A.*, *High A.* Snow-line varies from 8900 ft. on S. side to 9200 on N.; glaciers of upper valleys descend to 4000-5000 ft. above sea-level—Aletsch, 4400 ft., Gorner-Boden, 5250. Topographically divided into *Western A.*, extending N. and S. from Mont Blanc to Col dell'Altare; *Middle A.*, from E. of Mont Blanc to line drawn from Upper Adige to Inn at Innsbruck; *Eastern A.*, from this line eastward. Best-known peaks of Western A.—Gran Paradiso (13,320 ft.), Mont Blanc (15,775), Dent du Midi (10,600); of Middle A., Matterhorn (14,775), Monte Rosa (15,215), Strahlhorn (13,745), Mischabelhörner (14,935), Aletschhorn (13,770), Jungfrau (13,670), Mönch (13,460), Finsteraarhorn (14,020), and Schreckhorn (13,380). Drained by Rhine and tributaries, Them, Aar, Reuss, Limmat; Danube and tributaries, Iller, Lech, Isar, Inn, etc.; Po and tributaries, Dora Riparia, Ticino, Mincio, Adige, etc.; Rhone with Arve, Isère, Durance; and smaller streams flowing to Adriatic and Ligurian Sea.

Chief **PASSES**: from Turin, Coll del Altare to Savona; Col di Genevra, by Dora Riparia to Durance; Little St. Bernard by Dora Baltea and Aosta to Isère, S. of Mont Blanc; Great St. Bernard, E. of Mont Blanc to Rhone; Mont Cenis, by Dora Riparia N.W. to Arc and Isère. From Milan, Simplon from Maggiore to Brieg; St. Gothard, from Ticino to Upper Reuss valley; Bernardino, from Ticino to Rhine; Splügen, from Como to Rhine; Maloja, from Como to Upper Inn; Julier, from Upper Rhine to Inn; Stelvio, from Como to Upper Adige. Others are Arlberg from Upper Rhine to Ill; Brenner from Adige to Innsbruck; Semmering, S.W. of Vienna, between Upper Mur and Upper Leitha; Furka between Upper Rhone and Upper Reuss. There are **RAILWAYS** crossing by Col dell'Altare; Mont Cenis, tunnel over 7½ miles long, opened 1871; Simplon, two parallel tunnels, opened 1906; St. Gothard, tunnel over 9½ miles long, opened 1882; Arlberg, opened 1884; Brenner, opened 1867, series of twenty-seven tunnels; Semmering, opened 1853. Highest villages, Juf (6998 ft.) in Grisons, L'Ecot (6713) in Savoy, St. Véran (6726) in Dauphiné, Trépalles in Ital. A. (6788), Ober Gurgl (6322) and Fend (6211) in Tirolese A.

Geology.—Eastern A. composed of central zone of crystalline and schistose rocks, with Mesozoic bands on either side, and outer zone of Tertiary deposits to N. Latter divided into outer band of Molasse and inner band of Flysch; former composed of conglomerates and sandstones, latter of sandstones and shales. In Bavarian and Austrian A., Mesozoic zone composed chiefly of Trias, with Jurassic and Cretaceous beds; all three composed largely of limestone. Central crystalline zone composed mainly of gneiss and schist, but has Paleozoic beds dividing it. In Swiss A. Molasse is practically same as in Eastern A., but Flysch is incorporated with Mesozoic; Trias is almost non-existent, Mesozoic being largely composed of Jurassic and Cretaceous beds. Remarkable masses of different formation occasionally occur, known as *Klippen*, consisting of Jurassic and Triassic beds like those of Eastern A. In Western ranges, Molasse

is found; patches of Eocene occur in Mesozoic belt, which here is most important, composed chiefly of Jurassic and Cretaceous beds. Chief chain composed of schist and crystalline. Chief mineral products, iron, lead, rock-salt, mercury; gold, silver, copper, etc., also found.

Climate naturally varies with altitude. A. may be divided according to climate into six regions. (1) At base of mountains in N. Italy are sheltered districts producing olives, which require mean temperature of 42° F. in winter, and in summer continuous heat of at least 75° F. (2) In deep valleys and farther up on sunny slopes are regions producing vines, which require mean temperature in summer of 68° F. (3) Mountainous or deciduous, the region extends to about 4000 ft. above sea-level on northern side and sometimes to 5500 on S.; snow lies several months, spring and summer warmer than in England. (4) Sub-alpine or coniferous tree region, from 4000 to 5500 or 6000 ft. above sea-level on north, to 7000 ft. on south. (5) Alpine region, between tree limit and permanent snow. (6) Glacial region of permanent snow, where there is intense frost at night, and often temperature of 80° F. by day.

Flora.—Distinctive Alpine plants include gentians, saxifrages, rhododendrons, primulas, edelweiss; general characteristics are dwarfish woody stems, large flowers, woolly texture. **FAUNA** includes bouquetin, chamois, marmot, white hare, fox, lynx, wild cat, wolf, bear; vultures, eagles, ptarmigan, grouse, etc., are found.

History.—Little known of early inhabitants except names of few tribes conquered by Augustus; various Teutonic tribes invaded and occupied district in V. and VI. cent's, and Franks also occupied them transiently. History becomes traceable only in X. and XI. cent's with break-up of Carolingian empire. Struggle for Western Alps was carried on between Savoy, Dauphiné, and Provence; subsequently between Savoy and France, latter ultimately obtaining whole of western slope. In central region occurred gradual establishment of Swiss Confederation, 1291-1815. Eastern district was connected historically with Hapsburgs, who obtained northern slope of East A. in XV. cent., and subsequently gained Ampèze Valley (1517), Venetia (1797), and other districts on southern slopes; but lost Milanese and Bergamasca to Savoy in 1859, and Venetia in 1866, now possessing only Trentino on southern slope. Italy holds in non-Ital. A., Livigno Valley, Tenda, and some hunting districts of Maritime A.

The A. have been very thoroughly explored since beginning of XIX. cent. Previous to that, Mont Blanc had been ascended and about sixty-five glaciers were known. Jungfrau and Finsteraarhorn were conquered in 1811 and 1812 respectively; and henceforth mountaineering greatly increased, many Alpine clubs being established.

Sir Martin Conway, *The Alps* (1904).

ALPUJARRAS (37° N., 3° 15' E.), mountainous region, Granada, Spain.

ALQUIFOU (same Arab. root as alcohol), a lead ore found in Cornwall, used in pottery to give a green glaze.

ALRUNA, a witch of old Teutonic tradition; figure carved from a mandrake.

ALSACE, ELSSASS (48° 20' N., 7° 20' E.), former Fr. province, taken by Germany, 1871; formed part of Empire from VII. cent.; great part ceded to France, 1648; chief river, Ill; wooded hills; produces corn, fruits, flax, tobacco, silver, copper, lead, coal, iron; manufactures textiles. Principal towns, Mülhausen, Colmar, Strassburg.

ALSACE-LORRAINE, ELSSASS-LOTHRINGEN (48° 50' N., 7° 3' E.), province, Germany; area, 5800 sq. miles; Northern part is portion of Rhine plain; W. is occupied by Vosges Mountains; produces cereals, potatoes, tobacco, flax, hops; manufactures glass, porcelain, textiles; coal, iron, and salt mines; chief towns, Strassburg, Metz, Mülhausen; ceded by

France, 1871; constitution granted, 1911, conferring three votes in Federal Council and local self-government by Diet of two chambers. Pop. (1910) 1,872,000. See FRANCO-GERMAN WAR.

ALSATIA (48° 20' N., 7° 20' E.), old name for Alsace. It was also the name given to the Whitefriars district, London, which, till 1697, was a debtors' sanctuary and haunt of thieves.

ALSEN (55° N., 9° 55' E.), Prussian island, Baltic. Pop. 25,000.

AL-SIRAT, the perilous bridge over Hell to Muslim Paradise.

ALSIUM (41° 56' N., 12° 6' E.), old city, Etruria; modern Palo.

ALSTADEN (51° 27' N., 6° 50' E.), village, Rhine province, Prussia; coal.

ALSTÄTTEN (47° 22' N., 9° 25' E.), village, St. Gall, Switzerland; sulphur springs.

ALSTER (53° 37' N., 10° 1' E.), river, Holstein, Germany; enters Elbe at Hamburg.

ALSTON (54° 48' N., 2° 27' W.), town, Cumberland. Pop. (1911) 3075.

ALSTON, CHARLES (1683-1760), Scot. botanist; lecturer on materia medica and bot. at Edinburgh; pub. a plant catalogue and criticisms of Linnaeus' system of classification.

ALSTRÖMER, JONAS (1685-1761), Swed. reformer; lived some time in London, and introduced Eng. industrial methods to his own country; author of book on sheep-breeding.

ALT DAMM (53° 23' N., 14° 43' E.), town, Pomerania, Prussia.

ALTAI (50° 50' N., 85° E.), mountains, Siberia and Mongolia, Asia; separate Semirychensk, Russia, from E. Turkestan, and outline Gobi Desert on N. Kolyvan A. or Sailughem chain extends N.E. from A. proper to Sayan range. A. proper stretch E. in two parallel ranges to Gobi. Latter constituted chiefly of gneiss and Archæan rocks; former of granites, schists, slate, with Carboniferous and Devonian deposits. Flora includes alpine and herbaceous plants. Minerals include gold, silver, copper, zinc, lead. Inhabitants engage in agriculture. Chief town, Barnaul. Pop. c. 800,000.

ALTAIR, name in astronomy for a Aquile, the brightest star in constellation of Aquila.

ALTAMABA (31° 40' N., 81° 54' W.), navigable river, Georgia, U.S.

ALTMURA (40° 49' N., 16° 33' E.), town, Italy. Pop. 22,729.

ALTAR.—Wherever sacrifice has been offered a's are found; they exist, therefore, in most of the world's religions. Catholicism has its sacrifice of the mass, but in Protestantism, especially where, as in Calvinism, its eucharistic theory is furthest removed from Catholicism, there is no a. In ancient Egypt a large block, often granite, served as an a. According to *Exodus* 20th, 'In every place where I record my name I will come unto thee, and I will bless thee.' An a. was not to be of hewn stone. When the Temple was built its sacrificial ritual required an a. for burnt-offering and an a. of incense. In Greece and Rome a's were places of sanctuary. In the Christian Church wooden tables were used at first for the Holy Communion. More elaborate a's appear only in the III. cent. In the R.C. Church the a. consists of supports, the super-a. or slab, and a cavity for relics. The a. or a.-stone (a stone let into the super-a.) must be consecrated.

In the Eng. Church the term a. was expunged from the Prayer Book of 1552; but it has always been retained in the Coronation service, and since the Oxford movement it has come into use again.

ALTAZIMUTH (Lat. *altus*, high; Arab. *as-sumuth*, a way, a road), an instrument used for finding the altitude and azimuth of a celestial body. The eye-piece of the instrument contains a micrometer, made by stretching spider web across the field of view.

ALTDORF (46° 52' N., 8° 39' E.), town, Lake Lucerne, Switzerland; cradle of Swiss liberty; associated with William Tell (q.v.). Pop. 3117.

ALTDORFER, ALBRECHT (b. 1480), Ger. artist and engraver; his work as engraver ranks only below that of his teacher Dürer; one of the 'Little Masters.'

ALTEN, KARL AUGUST, COUNT OF (1764-1840), Brit. and Hanoverian commander; served under Wellington in Peninsular War; commanded 3rd Division at Waterloo.

ALTENA (51° 18' N., 7° 40' E.), town, Prussia; manufactures hardware. Pop. c. 13,000.

ALTENBURG (50° 59' N., 12° 25' E.), cathedral town, capital of Duchy of Saxo-A., Germany; scene of Prinzenraub. Pop. 40,000.

ALTENDORF, suburb of Essen (q.v.), Germany, with dwellings of Krupp employees.

ALTENSTEIN, castle near Eisenach, Saxo-Meiningen, Germany. Luther seized in neighbourhood, 1521.

ALTENSTEIN, KARL, BARON VON STEIN ZUM (1770-1840), Ger. statesman and writer; greatly promoted Prussian schools and universities.

ALTHEA (classical myth.), wife of Deneus, King of Calydon; mother of Meleager (q.v.).

ALTEN (1709-74), Persian refugee, who introduced the cultivation of madder into France.

ALTHING, Parliament of Iceland (q.v.).

ALTHORN, tenor valved bugle, sometimes used in place of the Fr. horn.

ALTHORP LIBRARY, THE, formed by 2nd Earl Spencer, probably most valuable private library ever collected; ultimately sold to Mrs. Rylands, and formed nucleus of the *John Rylands Library*, Manchester. It is particularly rich in rare early printed books.

ALTINUM (45° 34' N., 12° 24' E.), old town, Venetia; modern, Altino.

ALTITUDE, perpendicular elevation of a point above a given level; (astron.), the apparent angular elevation of a heavenly body above the horizon, called true a. when it is corrected for refraction and dip of the horizon; (geom.), the perpendicular distance from the base of a figure to the summit or vertex, as in a triangle, pyramid, etc.

ALTMÜHL (49° 2' N., 11° 30' E.), river, Germany; joins Danube.

ALTO, mus. term; highest male voice, counter tenor; female voice of like range is *contralto*.

ALTON (38° 55' N., 90° 15' W.), town, Illinois, U.S.; military academy and Baptist coll.; manufactures glass, hardware, tools. Pop. (1910) 17,528.

ALTON (51° 9' N., 0° 58' W.), town, Hampshire. Pop. (1911) 5555.

ALTONA (53° 34' N., 9° 57' E.), town, Germany, on Elbe, close to Hamburg; fine docks; trades with Britain, France, America; burnt by Swedes, 1713; Prussian since 1866; joined Zollverein, 1888. Pop. (1910) 172,500.

ALTOONA (40° 31' N., 78° 25' W.), town, Pennsylvania; centre of railway work. Pop. (1910) 52,127.

ALTO-RELIEVO, **ALTO-RELIEVO**, in sculpture, high relief (q.v.), in contrast to *basso-relievo*, which is shallow; figures project from surface by at least half their thickness.

ALTÖTTING (48° 12' N., 12° 44' E.), town, Bavaria; resort of pilgrims. Pop. 4344.

ALTRANSTÄDT (51° 18' N., 12° 10' E.), village, Prussia; by treaty of A. (1706) August II. of Saxony lost Poland to Charles XII. of Sweden.

ALTRINCHAM (53° 24' N., 2° 20' W.), town, Cheshire, England. Pop. (1911) 17,810.

ALTRUISM, ethical term used by Comte, meaning regard for, and devotion to, the interests of others; opposed to individualism or egoism. See ETHICS.

ALTWASSER (50° 50' N., 16° 18' E.), town, Prussia. Pop. 15,000.

ALTYN-TAGH (39° N., 89° E.), mountains, range of Kuen-lun, Central Asia.

ALUM ($K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O$), potash alum, is a colourless salt crystallising in octahedra, used as a mordant in dyeing and in medicine as an astringent and styptic. The term is also applied to salts in which potassium may be replaced by any of the other alkali metals or ammonium, and aluminium by ferric iron or chromium. The most important minerals from which it is obtained are a. schist, alunite, bauxite, and cryolite.

ALUMINA (Al_2O_3), oxide of aluminium, occurring naturally as corundum, ruby, and sapphire.

ALUMINIUM (Al=27), bluish silver-white, malleable, ductile trivalent metallic element of low specific gravity (a. 2.6) and high conductivity of heat and electricity, M.P. about 700°. It is widely distributed, but only in compounds, constituting about 7 per. cent. of the earth's crust. Its principal minerals are the silicates kaolin, felspar, and mica, and cryolite (Na_3AlF_6), corundum (Al_2O_3), bauxite ($Al_2O_3 \cdot 2H_2O$), alunite ($K(AlO_2)_3(SO_4)_3 \cdot 3H_2O$), diaspor ($AlO(OH)$). Davy was able to obtain an iron alloy by the electric decomposition of alumina with an iron wire in 1800 and called the element 'aluminium,' but it was first isolated by Wöhler in 1827, by reducing the chloride with potassium. With the cheapening of electric power it has become possible to obtain a. on a commercial scale. The Hall-Héroult process, now in general use, consists of electrolysing cryolite or a corresponding mixture of alumina and sodium fluoride in an iron 'cell' lined with carbon, the cast-iron bottom and the already reduced a. forming the cathode connected with the negative pole of the dynamo, and adjustable carbon rods dipping into the mixture forming the anode. Large a. works have been established at the Falls of the Rhine (Neuhausen and Rheinfelden), Niagara Falls, and the Falls of Foyers. Owing to its qualities and the reduction in its price, the metal is becoming used more and more extensively for parts of engines, in boat-building, for cooking utensils, parts of airships and aeroplanes, for various electrical and scientific apparatus, as a substitute for lithographic stone, and together with powdered iron oxides in the thermite (q.v.) process of welding and soldering. Numerous alloys of a. have been manufactured, which are being increasingly employed on account of their greater strength and hardness, e.g. magnalium (a. and magnesium) and a. bronzes (copper and 2.5 to 10 per cent. a.).

J. W. Richards, *Aluminium*, 3rd ed., London, 1896.

ALUMNUS, originally foster-son, or male pupil; graduate of coll. or univ.

ALUNITE, **ALUMSTONE** ($KAl_2(SO_4)_2(OH)_2$), colourless or white mineral occurring in volcanic rocks in Hungary, Italy, and New S. Wales, sometimes crystallised in rhombohedra.

ALURE, **VALURE**, in arch., name for passage behind parapet.

ALURED OF BEVERLEY (d. 1129), Eng. chronicler; sacrist of Beverley minster; his *Annales* begin with the Brit. period and extend to his own time.

ALVA (56° 9' N., 3° 48' W.), burgh, Clackmannanshire, Scotland. Pop. 4332.

ALVA or **ALBA**, **DUKE OF**, **FERNANDO ALVAREZ DE TOLEDO** (1509-83), Span. statesman and soldier; fought at Pavia, in Hungary, Algiers; commander-in-chief when thirty; or. duke as reward for defence of N. Spain; fought in Italy against pope and French, 1556. A. is notorious for his Netherlands campaign (1567-73); set up the 'Bloody Council' and boasted of executing 18,000 men. He had unlimited power; imposed heavy taxes; executed Counts Egmont and Horn, Prot. leaders. Holland and Zealand destroyed his fleet, and he left for Spain; d. after fierce campaign against Don Antonio of Portugal.

Motley, *Dutch Republic*.

ALVARADO, PEDRO DE (1495-1541), Span. conquistador; chief officer under Cortes in conquest of Mexico; gov. of Guatemala.

ALVAREZ, DON JOSÉ (1768-1827), leading Span. sculptor; statue of Ganymede, in Prado, fine example of his work; court-sculptor to Ferdinand VII.

ALVAREZ, FRANCISCO (c. 1465-1540), Portug. explorer and missionary; spent six years in Abyssinia; pub. an account of his travels.

ALVAREZ, LUIS (1841-1901), Span. artist; highly successful in hist. and genre pictures; works: *Philip II.*, *Isabella the Catholic*, *The Charity Bazaar*.

ALVENSLEBEN, CONSTANTIN VON (1809-92), Pruss. general, distinguished service in Franco-German War; received order of Black Eagle (1892).

ALVEOLUS (zool.), pit or cavity, as the socket of a tooth, the terminating part of a gland, or a cell of a honeycomb.

ALVERSTONE, RICHARD EVERARD WEBSTER, 1st BARON (1842-), Lord Chief-Justice of England (since 1900); thrice Attorney-General under Lord Salisbury; represented Gt. Britain in Bering Sea arbitration (1893) and the Alaska Boundary Commission (1903); engaged in Parnell Commission (1888-89); Master of the Rolls (1900); raised to peerage (1900).

ALVINCZY, JOSEPH, BARON VON (1735-1810), Austrian general; Ital. commander-in-chief; defeated by French at *Arcole* (1796) and *Rivoli* (1797); subsequently gov. of Hungary; made field-marshal (1808).

ALWAR (27° 40' N., 76° 30' E.), state, Rajputana, India; area, 3200 sq. miles. Pop. (1911) 792,000. Capital, **Alwar** (27° 34' N., 76° 35' E.), has palaces. Pop. 57,000.

ALYATTES (609-560 B.C.), King of Lydia and founder of its empire.

ALYPIUS (IV. cent.), Gk. musical writer; his *Introductio Musica* has been edit. by Jans (1895).

ALYTES OBSTETRICANS, the midwife toad of central and S.W. Europe, the male of which winds the strings of eggs about his hind legs and shelters them in dark and moist places and enters the water when the time for hatching the tadpoles has come.

ALYTH (56° 38' N., 3° 14' W.), town and parish, E. Perthshire, Scotland; linen weaving.

ALZEY (49° 46' N., 8° 6' E.), town, Rhenish Hesse. Pop. 8000.

ALZOG, JOHANN BAPTIST (1808-78), Ger. theologian; wrote *Manual of Church History*.

AMADEO, GIOVANNI ANTONIO (1447-1522), Ital. sculptor and arch.; famed for statues in the Colleoni chapel, Bergamo; was also engaged in designing Milan cathedral.

AMADEUS I. (1845-90), Span. king, elected, 1870; Duke of Aosta, 2nd s. of King Victor Emmanuel, Italy; tried to rule constitutionally and failed because of factions; almost assassinated, 1872; abdicated, 1873.

AMADEUS V., THE GREAT (1240-1323), Count of Savoy; famed for his wisdom and military exploits.

AMADEUS VIII. (1383-1451), Duke of Savoy; extended his dominions, but subsequently retired to monastery; elected pope as Felix V., but was not recognised by Church.

AMADEUS, LAKE (24° 30' S., 130° 30' E.), shallow salt lake in S.W. Australia, discovered by Ernest Giles (1872).

AMADIS OF GAUL, famous mediæval cycle of romance, especially popular in Iberian Peninsula, and similar in style to the Arthurian and Charlemagne cycles; earliest existing version is by Vasco de Lobeira (early XV. cent.); Eng. version by Southey. Amadis, 'the Knight of the Lion,' represents the type of the devoted lover and knight-errant who is caricatured in *Don Quixote*.

AMADOU (Fr.), spongy substance obtained from species of the fungus *Polyporus*; used as tinder after having been soaked in a solution of saltpetre.

AMAGER (56° 40' N., 12° 38' E.), small island, off Zealand, Denmark; market produce.

AMAKUSA (32° 20' N., 130° 5' E.), island, Japan; coal, kaolin.

AMALARIC (d. 531), King of Visigoths; m. Clotilda, dau. of Clovis, King of Franks.

AMALEKITES, tribe inhabiting district to S. of Judah; hereditary foes of Israelites; crushed by Saul and David.

AMALFI (40° 38' N., 14° 36' E.), port and abp.'s see on N. of Gulf of Salerno, Italy; of great importance in Middle Ages, ruled by its own Doges, and a formidable rival to Venice, Genoa, and Pisa; much injured by sea in XII. and XIV. cent's; now of little commercial importance. Pop. 6700.

AMALGAM, alloy of mercury with other metals, which is liquid or solid according to the proportion of mercury; A's are used for silvering mirrors, and for tooth-cements; also in process of extracting gold and silver from ore, and for frictional machines.

AMALIA, ANNA, DUCHESS OF SAXE-WEIMAR-EISENACH (1739-1807), Ger. patron of lit. and art; friend of Goethe.

AMALRIC I., King of Jerusalem (1162-74), continued long and fierce struggle for the possession of Egypt, of which Saladin ultimately became king.

AMALRIC II., King of Jerusalem (1197-1205); reign likewise disturbed by frequent conflicts with Muhammadans.

AMALRIC OF BENA (d. c. 1204), Fr. theologian and dialectician; his views led to conflict with the religious authorities; his body was burnt after death.

AMALTHEIA (classical myth.), goat which suckled the infant Zeus. One of its horns, which was broken off, was known as the *Cornucopia*, or horn of plenty.

AMANA (41° 44' N., 91° 51' W.), township, Iowa, U.S.; site of A. Society, Ger. communistic religious association, founded 1885.

AMANITA, widely distributed genus of mushrooms of which the fly agaric (*A. muscaria*), the death-cup (*A. phalloides*), and the destroying angel (*A. verna*) are well-known poisonous representatives in Brit. autumn woods.

AMAPALA (13° 3' N., 87° 9' W.), seaport, Pacific, Honduras. Pop. c. 4000.

AMARA (31° 50' N., 47° E.), town, on Tigris, Basra, Asiatic Turkey.

AMARA SIMHA (375 A.D.), Hindu grammarian, compiled the *Amara-Kosha*, Sanskrit vocabulary of ten thousand words, in metro.

AMARANTH, AMARANT (*Amaranthus*), genus of plants with purplish flowers clustered on spikes, which, owing to their not withering soon, have been represented in mythology and poetry as symbols of immortality. Love-les-bleeding (*A. caudatus*) and prince's feather (*A. hypochondriacus*) are well-known garden flowers.

AMARAPURA (21° 50' S., 96° 8' E.), former capital of Burma; destroyed by fire, 1810, earthquake, 1839; near Mandalay.

AMARAR, tribe of four great families of Arab descent dwelling in Etbsi, on Red Sea.

AMARGOSA (36° N., 116° 30' W.), river, flows into A. Desert, S. California.

AMARI, MICHELE (1806-89), Ital. scholar and patriot; prof. of Arabic at Florence; wrote on Sicilian Vespers; trans. Scott's *Marmion*; friend of Mazzini.

AMARYLLIS, a shepherdess in classical poetry.

AMASIA (40° 37' N., 35° 54' E.), town, Asia Minor; once capital of Pontus. Pop. 30,000.

AMASIS I. (XVI. cent. B.C.), King of Egypt, founder of XVIII. dynasty; successful warrior. **Amasis II.** (570-526 B.C.), last king to retain the crown of Egypt; an able ruler; his s., Psammetichus III., was dethroned by the Persians.

AMATEUR, one who engages in an art, game, or physical exercise, for pleasure and not for gain. The A. Athletic Association defines an a. as 'one who has never competed for a money prize or staked bet, either with or against a professional for any prize, or who has never taught, pursued, or assisted in the practice of athletic exercises as a means of obtaining a livelihood.'

AMATHUS (34° 41' N., 33° 7' E.), ancient town, Cyprus; ruined; old tombs, antiquities.

AMATI, ANDREA (c. 1530-1611), founder of the Cremona school of violin-makers; his bro., Nicola, and his sons, Antonio and Girolamo, were also distinguished makers. The most famous craftsman of the family was Nicola A. (1596-1684), s. of Girolamo; maker of the 'grand Amati' violin; one of his pupils was Antonius Stradivarius; Nicola's violins are valued at anything up to £500.

AMATITLAN (14° 24' N., 90° 34' W.), town and district, Guatemala; cochineal industry.

AMATONGALAND (27° S., 33° E.), coast district, Natal, S. of Lorenzo Marques; separated from Zululand by Kosi River; now part of Natal; inhabitants—Tongas—belong to Bantu race. Pop. c. 42,000.

AMAUROSIS, term applied to blindness which is not caused by actual disease of the eye; may be due to brain disease, Bright's disease, diabetes, or excess of tobacco, alcohol, etc.

AMA-XOSA, AMAKOSA, branch of S. African Kaffirs.

AMAZON, AMAZONS, chief river of S. America, rising in the Peruvian Andes in two great branches, the Ucayali and the Marañon, which unite at Nauta, in N.E. of Peru, after which the river flows over 3200 miles right across Brazil, entering the Atlantic at the equator. The width increases from under two miles at the Brazilian boundary to fifty at the principal mouth; it is navigable for ocean steamers for about 2300 miles, and for smaller vessels about 180 miles farther. Trade is carried on by the A. Steam Navigation Company and by numbers of small steamers employed by rubber companies. The region it drains, an area of over 2,700,000 sq. miles, produces rubber, cotton, indigo, nuts, sugar, cacao, coffee, tobacco; and its course leads through vast impenetrable forests, where there are many natural channels which unite the different affluents. It is a rapid river, especially in times of flood; its waters abound in hundreds of kinds of fish, and great numbers of turtles are found. A great deal of silt is carried down, and has formed many islands, particularly near the mouth.

The principal ports are Tabatinga, on Peruvian boundary, Tefé, Manaos, Obidos, Santarem, Macapa, in Brazil; and the chief trading city is Para, near the mouth. The A. has about 200 tributaries, many of which are navigable. Besides Ucayali and Marañon the principal affluents are the Napo, Putumayo, Yapura, Negro from the N., and the Javary, Jurua, Purus, Madeira, Tapajós, and Xingu from the S. Napo rises on N. side of Cotopaxi; its affluents include the Coca and Aguariço. Putumayo, or Ica, rises near Pasto and joins A. at São Antonio. Yapura flows parallel to Putumayo, rises in Colombian Andes, and joins A. by several natural channels.

Negro is principal northern affluent of A., rises in Colombia, is joined by Branco, Uaupes, and other streams, and unites with A. below Manaos. Javary forms part of boundary between Brazil and Peru, and unites with Marañon at Tabatinga. Jurua rises in Peru and is sluggish stream. Purus also rises in Peru, is joined by Acre or Aquiri, and unites with A. in lat. 4° S. Madeira is largest tributary of A.; its head waters, the Beni and Marmore, rise in Bolivia and unite in lat. 10° 30' S.; in the upper reaches are many rapids; its affluents include the Blanco, Guapore, Mayutata, and it joins A. near Serpa. Tapajós is formed by confluence of Jurucua and Alta Tapajós in Matto Grosso, and joins A. near Santarem. Xingu rises in Matto Grosso, has many falls and rapids, and forms lake near the mouth, uniting with A. by multitude of streams. Of the smaller tributaries, the Trombetas, Nanay, Tigre, Pastaza, and Morona may be mentioned, all on the S. side. The Tocantins is sometimes called a tributary of the A., but is not so in reality.

Wallace, *Travels on the Amazon and Rio Negro*; Bates, *A Naturalist on the River Amazon* (1873); Wallace, *Travels on the River Amazon and Rio Negro* (1889).

AMAZON ANT, see SLAVE-MAKING A.

AMAZONAS (6° S., 75° W.), department, Peru. Pop. 53,000.

AMAZONAS (1° 15' N., 65° 50' W.), district, S. Venezuela.

AMAZONAS (2° 30' S., 61° W.), state, Brazil; capital, Manaus; rubber, cacao, nuts. Pop. 380,000.

AMAZONITE, **AMAZON STONE**, green microcline-felspar, found in pegmatite in U.S.A. and Madagascar, occasionally used polished as an ornament stone.

AMAZONS (i.e. breastless), legendary race of warlike women dwelling in Pontus; said to have cut or burnt off right breast that they might use their weapons more freely; men were not admitted to their dominions, but once yearly they met with the Gargareans in the mountains for the propagation of their race; male offspring were destroyed, or sent back to their fathers. See **PENTHESILIA**, **HIPPOLYTA**, and **ANTIOPE**.

AMBACA (9° 12' S., 15° 28' E.), town, Angola, W. Africa; coffee, sugar-cane.

AMBALA, see **UMBALLA**.

AMBARVALIA, ancient Roman festival, held in May, to propitiate the deities who watched over crops.

AMBASSADOR, Minister of State sent by a sovereign, or other power, as representative at a foreign court. The 'ambassador ordinary' is the bearer of sealed letters of credence, having (in Gt. Britain) the royal signature, in which the sovereign confirms any engagement undertaken in his name by the representative. He cannot, however, sign treaties or enter finally into any important arrangements without referring the matter to the home Government. An 'ambassador plenipotentiary,' on the other hand, possesses these higher privileges. 'Ambassador extraordinary' is a title which implies a representative of somewhat higher dignity, and is usually held for a limited period.

AMBATO (1° 10' S., 78° 50' W.), town, Ecuador. Pop. c. 10,000.

AMBER ($C_{10}H_{16}O$), yellow, brown, or reddish translucent resin becoming electrically charged by friction, in Oligocene strata in E. Prussia, Miocene deposits in Sicily, Burma, and elsewhere, widely distributed evidence of extinct pine forests, and washed up by the sea on the foreshores of the Baltic, North Sea, and Mediterranean. It has formed an article of commerce from the earliest times, and is extensively cut and polished for mouthpieces of pipes, etc., beads, and other ornaments.

AMBERG (49° 28' N., 11° 50' E.), town, Bavaria. Pop. (1910) 25,000.

AMBERGER, CHRISTOPH (1500–61), Nuremberg artist; follower of Holbein; portraits and scriptural subjects.

AMBERGRIS, a grey or blackish odorous fatty substance, volatilising as a white vapour at c. 100°, found as a morbid concretion in the intestines of the sperm whale, or in masses from $\frac{1}{2}$ oz. to 150 lb. in weight floating in tropical seas; extensively used in the East for perfumery and pharmaceutical purposes.

AMBERT (45° 32' N., 3° 44' E.), town, Puy-de-Dôme, France. Pop. 3889.

AMBIORIX (fl. 54 B.C.), chief of Eburones, tribe of Belg. Gaul; fought against Quintus Cicero, who was relieved by Caesar.

AMBLESIDE (54° 28' N., 2° 58' W.), town, near Windermere, Westmoreland, England.

AMBLYGONITE ($Li(AlF)PO_4$), white or greenish yellow cleavable mineral occurring in pegmatite veins in Germany, France, Spain, and California.

AMBLYPODA, sub-order of extinct Ungulate mammals found in Eocene rocks of N. America and Europe. They are characterised by a small brain-cavity in comparison with the large body (size of rhinoceros); some species were provided with horns and tusks.

AMBLYSTOMA, N. American tailed amphibian,

of Salamander family; larval form, **AXOLOTL**, sometimes persists and is fertile.

AMBO, reading-desk of the Early Church; superseded in later times by lectern and pulpit.

AMBOISE (47° 45' N., 1° E.), town, Indre-et-Loire, France; famed for its historic castle, where Charles VIII. was b. and d., and Abd-el-Kader imprisoned, 1848–52; also for the Huguenot conspiracy directed against Francis II., when 1200 of the inhabitants lost their lives; and for the 'Edict of A.', 1563, by which Catherine de' Medici made concessions to the Protestants. Pop. 4632.

AMBOISE, GEORGES D' (1460–1510), Fr. cardinal; Prime Minister under Louis XII.; Church reformer; patron of art and letters.

AMBOYNA (3° 45' S., 123° 15' E.), town, island, and residency, Dutch E. Indies; town has fishing and agricultural industries. Pop. 8000. Island (most important of Moluccas), volcanic; produces cloves, spices, cocoa, fruit. Pop. 39,000. Residency includes numerous islands. Pop. 296,000.

AMBRACIA (39° 3' N., 21° 2' E.), old Corinthian colony, Greece.

AMBRIZ (7° 55' S., 13° 10' E.), seaport and division, Angola. Pop. c. 2500.

AMBROS, AUGUST WILHELM (1816–76), Austrian musician; famed for his *History of Music*.

AMBROSE (c. 1100), Norman poet; accompanied Richard I. to Holy Land, and wrote a rhyming (but reliable) chronicle of Third Crusade.

AMBROSE, ST. (c. 340–97), Father of the Church; s. of prefect of Gallia Narbonensis; b. at Trèves; rose to be consular prefect of Liguria and Emilia; not yet baptized, he was made bp. of Milan, 374, on death of Auxentius; episcopate marked by Gothic inroad and brief flight to Illyricum; pres. of synod at Aquileia, 381, to consider Arian heresy; controversy with Rom. Symmachus (q.v.), who was one of last pagans; resisted Valentinian's effort to enforce Arianism on Rome; remained under usurpation of Maximus; rebuked Emperor Theodosius for bloodshed at Thessalonica, 390; died on success of Eugenius, 392; gifts of administration and strenuous ascetic ideals; great writer of hymns, but *Te Deum* wrongly ascribed to him. **AMBROSIAN** or **MILANESSE LITURGY**, which differs in several points from Rom., was traditionally drawn up for Milan by St. Barnabas. Ambrosian Chant, method of antiphonal singing in W. Church, is ascribed to St. A. **Ambrosian Library** (*Biblioteca Ambrosiana*) founded at Milan by Cardinal Borromeo, 1602; among its 8400 MSS. is a Vergil.

AMBROSE THE CAMALDULIAN, **AMBROSIO TRAVERSARI** (1386–1439), Ital. priest; became general of the Camaldolese Order (q.v.).

AMBROSIA (classical myth.), the food of the gods, conferring immortality; also an unguent or perfume.

AMBROSIA BEETLES, see **RYNCHOPHORUS BEETLES**.

AMBROSINIANS, mediæval religious brotherhood established in neighbourhood of Milan; also name of Anabaptist sect in XVI. cent.

AMBROSIANES, commentary, long attributed to St. Ambrose, on St. Paul's Epistles, but authorship disputed by Erasmus and others.

AMBROSINI, BARTOLOMEO (1583–1657), Ital. naturalist; pupil of Aldrovandi; successively prof. of Philosophy, Bot., and Med. at Bologna; fought the plague in 1630.

AMBROSIUS (V. cent.), leader of Britons against the invading Saxons.

AMBRY, AUMBRLE, AUMERY, or ALMERY, term in arch. for a recess, niche.

AMBULANCE, a moving hospital following an army in the field, and treating the wounded and sick until they can be removed back to more permanent establishments. The term is also commonly applied to wagons for the conveyance of sick and wounded. Military a's were introduced to a certain extent by Napoleon I., but those according to modern ideas

were instituted in the American Civil War, and have proved of the greatest value in every subsequent war. In war, according to the Brit. organisation, the wounded are collected by regimental bearers at the firing line and carried to the collecting station, whence they are taken to the dressing station by bearers of the Royal Army Medical Corps, and then if necessary to the field hospital. Operations are carried out both at the dressing station (if urgent) and at the field hospital. The Red Cross Society and other charitable societies are associated with the military authorities in modern warfare. Numerous civil a. associations have been founded in Britain, the Brit. colonies, U.S.A., and abroad, the St. John of Jerusalem Association being probably the most important.

AMBUR (12° 45' N., 78° 40' E.), small town, Madras, India; fort.

AMELAND, peninsula, province of Friesland, Holland. Pop. c. 2000.

AMELIA (42° 33' N., 12° 26' E.), town, Umbria, Italy.

AMÉLIE-LES-BAINS (42° 27' N., 2° 37' E.), small town, Eastern Pyrenees, France; hot springs known in Roman times.

AMELOT DE LA HOUSSE (1634-1706), Fr. historian; sent to Venice as sec. to an Embassy, he published a criticism of the administration of the republic which drew a protest from the Venetian ambassador; author was sent to the Bastille.

AMEN, Hebrew word, equivalent to 'so let it be,' used in Christian worship at close of prayers and hymns.

AMENDE HONORABLE, originally a mode of punishment in France; the offender, stripped to his shirt and led into court with a rope round his neck by the public executioner, had to beg pardon on his knees of God, of his king, and his country; now used for a satisfactory apology.

AMENHOTEP, **AMENOPHIS**, name of three Egyptian kings about XVII.-XV. cent. B.C.

AMENORRHEA, see GYNECOLOGY.

AMENITES, the nether world of the ancient Egyptians where Osiris delivered judgment, from which the Gk. Hades was derived.

AMENTIFERÆ, **AMENTACEÆ**, obsolescent term used for a class of plants having flowers in catkins and including willow, poplar, oak, beech, birch, plane, walnut, hazel, etc.

AMERBACH, JOHANN (d. 1515), printer of Basel; first to use Roman type instead of Gothic and Italian.

AMERCEMENT, discretionary penalty imposed by a court of law, differing from a fine in that the sum was not fixed by statute. As an Eng. legal process it was in use as early as the XIII. cent., and its regulation was provided for in Magna Carta.

AMERIA (42° 34' N., 12° 25' E.), town, Italy; Roman remains.

AMERICA (71° N. to 54° S., 35° to 170° W.), two continents (connected by isthmus), Western hemisphere; comprises North, South, and Central America; total area, c. 16,000,000 sq. miles; total p., c. 170,000,000; named after the navigator, *nerigo Vespucci* (q.v.), who followed up Columbus.

North America (15° to 85° N., 55° to 170° W.) is bounded N. by Arctic Ocean, N.E. by Smith Sound, Baffin Bay, Davis Strait; S.E. by Atlantic; S. by Caribbean Sea, Gulf of Mexico, and Central A.; W. and S.W. by Bering Strait, Bering Sea, Pacific. Extreme length is c. 4500 miles; width, c. 3300 miles; area, c. 8,300,000 sq. miles. Continent expands broadly in N. and tapers to the S. Coast-line is much indented. Surface consists of great lowland region in centre, drained by large rivers; in E. are highlands and in W. high mountain ranges. Principal **MOUNTAINS** in W. are the Rockies, and a parallel range known as Sierra Nevada in California and as Cascade range farther north; chief peak of Rockies, Mt. Blanca, of Sierra Nevada, Mt. Whitney; and in E. Appalachian Mountains, highest peak, Mount Mitchell. Principal **RIVERS** are St. Lawrence in E., Yukon,

Fraser, Columbia, Colorado in W., Mississippi-Missouri, Peace-Mackenzie, Saskatchewan-Nelson draining central plains and flowing respectively to Gulf of Mexico, Arctic, and Hudson Bay. Chief **LAKES** are Great Bear, Great Slave, Athabasca, Deer, Wollaston, Winnipeg, in Canada; Superior, Michigan, Huron, Erie, Ontario, between Canada and U.S.A. Chief **ISLANDS** are Newfoundland, Cape Breton, Anticosti, Prince Edward's Island, off Quebec and New Brunswick; Vancouver, Queen Charlotte Islands, Prince of Wales Island, Aleutians, off W. coast; some of West Indies in S.

Climate varies; has great extremes. There are vast forests of pine, beech, oak, hickory, ash, sycamore, chestnut, and other trees; enormous quantities of wheat, maize, barley, millet, rice, potatoes, peas produced; many fruits cultivated; sugar, coffee, cotton, coconuts, vanilla grown. Minerals include coal, iron, gold, silver, copper, lead, salt, petroleum.

Political divisions are **GREENLAND** in N.E., Dan. colony; Dominion of **CANADA**, which includes all British North American possessions except Newfoundland, in northern half; **UNITED STATES OF AMERICA** and **MEXICO** in southern half; **Alaska** (q.v.) in N.W. corner belongs to U.S.A. Pop. c. 120,000,000.

Central America (8° to 21° 30' W., 77° 30' to 92° 50' W.), unites North and South A.; extreme length, c. 1000 miles; breadth, 70 to over 300 miles; area, c. 210,000 sq. miles; bounded N. by Mexico, E. by Caribbean Sea, S. and W. by Pacific. Northern part is mountainous, with steep slope to Pacific, and tableland, intersected by valleys, sloping more gradually to Atlantic; narrow southern part is mountain from sea to sea. Chief **MOUNTAINS** are the Sierra Madre in Guatemala, Cordillera de Yolaina in Nicaragua, Sierra de Tilaran in Costa Rica, Chiriqui range in Panama; many volcanoes, including Fuego, Tacana in Guatemala, Cosequina in Nicaragua, Chiriqui in Costa Rica. Principal **RIVERS** are Segovia, Patuca, Ulua, Grande, Motagua, San Juan. Chief **LAKES** are Nicaragua, Amatitlan, Atitlan, Managua, Izabal. Political divisions are **BRITISH HONDURAS** in N.E. and the independent states of **GUATEMALA**, **HONDURAS**, **SALVADOR**, **NICARAGUA**, **COSTA RICA**, and **PANAMA**. Climate varies according to elevation; earthquakes frequent. In tropical belt, rubber, mahogany, cacao occur; coffee and grain are largely produced; other products are sarsaparilla, tortoise-shell, fruits, indigo, hides. The people are of Indian or mixed Span. and Ind. race. Pop. c. 5,000,000.

The **WEST INDIES** lie to the E. of Central A., between North and South A. They include **CUBA** and **HAITI**, which are independent republics, the Bahamas, Barbados, Trinidad, Jamaica, Leeward, and Windward Islands, which belong to Britain.

South America (12° 25' N. to 56° S., 35° 15' to 81° 20' W.) is bounded N. by Caribbean Sea, N.E. by N. Atlantic, E.S.E. by S. Atlantic, W. by Pacific. Extreme length is c. 4750 miles; breadth, c. 3200 miles; area, 7,500,000 sq. miles. Whole of W. side is occupied by mountains, upland valleys, and plateaus of Andes (q.v.) from the N. of which an offshoot curves round by the N. side of the Orinoco. Along the S. side of the lower Orinoco, and eastward, is the plateau of Guiana; and in E., between mouth of Amazon and Rio de la Plata, is Plateau of Brazil. Rest of surface consists of great plains—wooded selvas and grassy pampas. N. is drained by Colombian Magdalena and Orinoco, N. centre by Amazon and its tributaries and Tocantins; extreme E. projection by San Francisco River; S. centre by Paraguay, Parana, Uruguay, and their tributaries. Coast-line little broken except at river mouths and along S. part of W. side. Chief lake is, **TITICACA**, in Bolivia and Peru.

Climate is generally temperate and equable. There are enormous forests, those in tropical regions having magnificent trees and flowering plants. Fruits grown include oranges, pine-apples, guavas, mangoes,

bananas; quassia, cinchona, tapioca, vanilla, indigo, cacao, sugar-cane also produced. Minerals include gold, silver, diamonds, copper, iron.

Political divisions are the republics of COLOMBIA, VENEZUELA, ECUADOR, BRAZIL, PERU, BOLIVIA, CHILE, ARGENTINA, PARAGUAY, URUGUAY; colonies of British, Dutch, and French GUIANA in N.E.; FALKLAND ISLANDS in S.E. belong to Britain. Pop. c. 45,000,000.

Geology of America.

—Rocky Mountains in North A. and Andes in South A. were formed by upheavals of Tertiary period, and are thus comparatively recent; Appalachians in North A. are of Palæozoic or early Mesozoic formation; E. Brazilian highlands in South A. and Adirondacks in North A. belong to Archæan period. From similarity between rocks on eastern coasts of A. and those on western coasts of Europe and Africa, and from existence of submerged mountain range running through Atlantic, it is believed that the Atlantic was formed by a rift valley.

Races.—Arctic regions of North A. are inhabited by ESKIMOS, a yellow race, who live chiefly by fishing and seal-hunting; they are short, fat, with black hair and brown skin. Their origin has not been authoritatively established. Aboriginal inhabitants of remainder of continent were INDIANS; these are generally tall and well developed, with black hair and high cheek-bones. They are called 'red Indians' from the copper-coloured skin of certain tribes. Best-known tribes are the Sioux in the western plains, the Iroquois in Canada and elsewhere, the Araucanians and Patagonians in South A. In Mexico and Central A. the people are chiefly creoles and half-breeds; in Brazil are large numbers of negroes and mulattoes, while the South American pampas are the home of a mixed race called the Gauchos. There are many negroes in U.S.A. The European inhabitants of North A. are chiefly of Brit., Ger., and Scandinavian descent, those in South A. of Span. and Portug. descent.

NATIVE CUSTOMS, etc.—Aborigines, both Eskimos and Indians, lived by hunting; former had underground huts or tents made of hides, latter inhabited skin wigwams; had only stone and wooden weapons, metal tools being unknown before coming of white men. Tribes were generally governed on clan system; most tribes practised polygamy, and women had consider-

able amount of power. Art was not unknown, and in intervals between hunting expeditions some tribes executed fine carvings on ivory. Women did sewing with sinew for thread, with which they made skin garments. Eskimos wore trousers and upper garments; in warmer regions short skirts were worn by women and breech cloths by men. They ornamented themselves by tattooing and painting, and warriors often had fringe of scalps adorning their garments.



General History.—Norsemen reached Greenland about X. cent., and visited the adjacent coast of America. No trace of their occupation remains, and America may be said to have been first discovered by Columbus, who reached the Bahamas in 1492. He afterwards made further discoveries, 1493-1504, in SOUTH AMERICA and the West Indies, but the further development of these regions was carried on principally by Span. and Portug. explorers. Brazil was discovered and annexed by the Portuguese in 1500; and

the Spaniards conquered Peru in 1524-33, Chili in 1540-53, and eventually became masters of practically whole of South A., except Brazil. Struggles occurred intermittently with other European powers, the English, Dutch, and French all making attempts to acquire territories in the South; the only dominions they permanently acquired, however, were the colonies of British, French, and Dutch Guiana. Brazil remained under Portug. control until 1822, when it estab-

General of Guatemala until 1821, when independence was declared. The five states, Guatemala, Salvador, Nicaragua, Costa Rica, and Panama, united as the federal republic of Central A. in 1823, which, however, only lasted until 1839. All except Costa Rica were reunited for three years, from 1842 to 1845; and since then several unsuccessful attempts at union have been made. British Honduras became a Brit. colony in 1850.

In NORTH AMERICA Newfoundland was probably discovered by John Cabot, who in 1497 commanded an expedition to the eastern shores of North A. About 1500 Labrador was reached by Cortereal, Florida in 1513 by Leon, Mexico and Central America were subdued by Spaniards in 1521-23. French made colonies in Canada, and English along E. coast, in XVII. cent. Settlement was made by English in Virginia in 1607; others were established in Maryland, Pennsylvania, and Massachusetts, where the Pilgrim Fathers settled in 1620. By 1750 all the seaboard between Florida and Canada belonged to England, who further acquired Canada from France in 1759. Amer. colonies rebelled in 1775, and became independent as U.S.A. in 1783.

Winsor, *Narrative and Critical Discovery of America* (Boston, 1884-89); Koene, *Ethnology* (1896); *Central and South America* (1901); Dawson and Gannett, *North America* (1898, 2 vols.); Bryce, *South America* (1912); Enock, *Secret of the Pacific* (1912).

AMERICA CUP,
see YACHTING.

AMERICA ISLANDS (0° to 6° N., c. 160° W.), islands, Pacific. Pop. c. 300.

AMERICAN, Civil War, Law, Literature, Union, War of Independence. See UNITED STATES.

AMERICAN INDIANS, see INDIANS.



lished itself as an independent empire; it became a republic in 1890. The Span. dominions were controlled by the mother country till XIX. cent., but they rose in revolt in 1810; long struggles ensued, but by 1826 they had all attained independence, and the Span. forces were finally expelled from the country in that year.

CENTRAL AMERICA was discovered by Columbus in 1502, and the whole region was subdued by Spain by 1525, remaining under Span. rule as the Captaincy-

AMERICAN INTERNATIONAL CONFERENCES, gatherings of representatives of all Amer. states to discuss matters of common interest. First, 1824, was convoked by Span. colonies to Panama, with idea of obtaining guarantee by the U.S.A. of their independence from Spain; invitation eagerly accepted by U.S.A., whose government, though not intending to violate peace with Spain, was anxious to acquire leadership of Amer. continent. Second, 1901, at Mexico, agreed to international arbitration

and established International Bureau of Amer. Republics.

AMERICAN ORGAN, see HARMONIUM.

AMERICANISMS are words or phrases current in the U.S. of America, but not in Britain. These may be divided under two headings, viz. words which were common to both countries before the Separation of 1783, but which have since become obsolete in England; and words which have come into use in America since that event. Among the former class may be placed: *chore*, trifling job, or errand; *creek*, small stream; *deck*, pack of cards; and *fall*, autumn. In the latter class may be indicated: *elevator*, for 'lift'; *section*, for district; *exposition*, for exhibition; *Dutchman*, for German; *candy*, any kind of sweetstuff; *biscuit*, hot roll; *cracker*, biscuit; *the cars*, a train; *dépôt*, railway station; *gums* or *rubbers*, goloshes, overshoes; *store*, shop; *railway*, tramway; *mail*, to post letters; *vine*, any climbing plant, and many others.

AMERICUS (32° 5' N., 84° 15' W.), town, Georgia. Pop. (1910) 8063.

AMERIND (contracted form of American Indian), term to describe primitive races of America.

AMERSFOORT (52° 10' N., 5° 24' E.), town, Holland. Pop. (1910) 24,000.

AMERSEHAM (51° 39' N., 0° 36' W.), town, Buckinghamshire. Pop. (1911) 9600.

AMES (42° N., 93° 38' W.), town, Iowa, U.S.A. Pop. (1910) 4233.

AMES, FISHER (1758-1808), Amer. statesman; took prominent part in political life during Washington's administration.

AMES, JOSEPH (1689-1759), Eng. author; his *Typographical Antiquities* (1749) deals with Eng. printing from 1471 to 1600.

AMES, WILLIAM (1576-1633), Puritan clergyman; fellow of Ch. Coll., Cambridge; stripped of his honours because of his denunciation of loose behaviour of the students; went to Holland, and by the fervour of his preaching obtained wide popularity; exercised considerable influence on the thought of his time.

AMESBURY (51° 11' N., 1° 48' W.), town, Wiltshire; old Brit. camp. Pop. 7000.

AMESBURY (42° 52' N., 70° 57' W.), town, Massachusetts; manufactures iron and cotton goods. Pop. 9000.

AMETABOLIC, term describing insects which do not undergo metamorphosis.

AMETHYST, clear violet or purple variety of quartz (*q.v.*) occurring in cavities in granitic rocks and mineral veins or in agate geodes (*q.v.*); used as a gem-stone, and formerly as an amulet to protect its wearer from intoxicating drink.

AMGA (60° N., 130° E.), river (400 miles long), Yakutsk, Siberia.

AMHARA (10° 35' N., 39° E.), province, Abyssinia; principal town, Gondar; Theodore, King of A., overthrown by British, 1868.

AMHERST (16° 2' N., 97° 35' E.), town and district, Burma.

AMHERST (42° 23' N., 72° 32' W.), village and township, Massachusetts; coll., with library, museum, observatory; also Agricultural Coll. Pop. 5313.

AMHERST (45° 52' N., 64° 5' W.), town, Nova Scotia. Pop. 5000.

AMHERST, BARON, JEFFREY AMHERST (1717-97), Brit. general; performed brilliant service in conquest of Canada; gov. of Virginia (1763); gov. of Guernsey (1770); or. peer (1776).

AMHERST, EARL, WILLIAM PITT AMHERST (1773-1857), gov.-gen. of India; nephew of Baron A., to whose title he succ.; or. earl, 1826.

AMIA, see BOWFINS.

AMIANTEUS, fine silky asbestos found in Cyprus, Euboea, Savoy, and elsewhere.

AMICE, priestly linen vestment of Western Church, worn about neck and shoulders, generally under the alb; upper central border in Middle Ages decorated with band

of embroidery ('apparel'), a custom still continued in many religious orders. When a. is turned down the apparel preserves it in hood shape. See ALMUC.

AMICI, GIOVANNI BATTISTA (1786-1863), Ital. astronomer; director of Florence observatory; invented immersion system and other improvements in microscope, and a new reflecting system in telescopes.

AMICIS, EDMONDO DE (1816-1908), Ital. writer; commenced life as soldier and fought at Custoza, 1866; published book of military sketches, 1867; retired from army, 1870, and wrote books on travel, some poetry, and several novels.

AMICUS CURIE, legal term referring to a person supplying special information during hearing of a case.

AMIDES, organic compounds derived from ammonia by the replacement of one (primary a.), two (secondary a. or imide), or three atoms of hydrogen (tertiary a.) by univalent acid radicals, e.g. Benzamide, $C_6H_5CONH_2$; Diacetamide $(C_2H_5O)_2NH$; Triacetamide $(C_2H_5O)_3N$.

AMIDINES, organic compounds which are monacid bases of the general formula $R.C(NH)NH_2$, e.g. in Acetamidine R is equivalent to CH_3 , in Benzamidine to C_6H_5 . The same carbon atom is, therefore, in union with an amidogen and an imido group.

AMIEL, HENRI FREDERIC (1821-81), professor of Aesthetics, later Ethics, at Geneva, whose published selections from his *Journal*, 1882-84, teem with suggestive thoughts on the vital issues of the day; translated by Mrs. Humphry Ward.

AMIENS (49° 53' N., 2° 18' W.), Fr. town, on Somme, old capital of Picardy; large manufacturing centre, producing silk, velvet, wool, hosiery; a bishopric; celebrated for its cathedral (1220-88), the finest example of Gothic arch. in France; birthplace of Peter the Hermit; also memorable for the *Treaty of A.*, by which peace was concluded between France and Britain in 1802. Pop. (1911) 93,200.

AMIDE, see BOWFINS.

AMINAH, mother of Muhammad (*q.v.*).

AMINES, organic compounds derived from ammonia (NH_3) by the replacement of one or more of the hydrogen atoms by hydrocarbon radicals (alkyls or aryls). According to the number of hydrogen atoms replaced, primary, secondary, and tertiary a. may be distinguished. *Aniline* ($C_6H_5NH_2$) is an example of an aromatic primary a. *Trimethylamine* ($(CH_3)_3N$) occurs as a by-product in beet-sugar manufacture. A. act as bases, forming salts with mineral acids.

AMINO-ACIDS, series of compounds like amino-acetic acid $[CH_2(NH_2).COOH]$, which collectively make up the molecules of albuminoid and protein substances.

AMIOT, JEAN JOSEPH MARIE (1718-93), Fr. Jesuit and Oriental scholar; went (1750) as missionary to China where he spent the rest of his life.

AMIR, AMER, Emir, Arabic name given to high officials in the East.

AMITERNUM (42° 27' N., 13° 30' E.), ancient Sabine town, Italy.

AMJEERA (22° 33' N., 75° 9' E.), town and district, Central India; thinly populated.

AMLWCH (53° 24' N., 4° 20' W.), town, Wales. Pop. 2720.

AMMAN, JOHANN CONRAD (1669-1724), Swiss physician; lived in Amsterdam; invented oral method of instructing the deaf and dumb (*q.v.*); explained in *Surdus loquens*, first pub. 1692.

AMMAN, JOST (1539-91), Swiss painter and wood engraver; executed woodcuts for Feierabend's Frankfurt Bible.

AMMANATI, BARTOLOMEO (1511-92), Florentine architect and sculptor; built *Ponte della Trinità* over the Arno, and made additions to Pitti Palace, Florence.

AMMER SEE (48° N., 11° 8' E.), lake (10 miles long), Bavaria.

AMMETER, see **AMPERMETER**.

AMMIANUS, MARCELLINUS (c. 330–400 A.D.), Roman historian; valuable narrative of contemporary events.

AMMIRATO, SCIPIONE (1531–1601), Ital. historian and ecclesiastic; famed for his accurate *Istorie Fiorentine* (1600).

AMMON, AMON, principal god of ancient Egyptians, generally represented as a man with ram's horns, or with ram's head. There was a temple of A. in Thebes and one in the Libyan Desert, to which Alexander the Great made a pilgrimage. The worship of A. spread to Greece and Rome.

AMMON, CHRISTOPH FRIEDRICH VON (1766–1850), Ger. theologian; wrote on Christian ethics and Church history.

AMMON, OTTO (1842–), Ger. anthropologist; propounder of theory, known by his name, that amongst human types the fair-complexioned and round-skulled display business and industrial qualities, and the dark and long-skulled a proclivity for learning and the higher professions.

AMMONIA (NH_3), colourless gas which does not support combustion, with characteristic pungent smell, occurring naturally in minute quantities in the atmosphere, in water, and in decomposition of nitrogenous organic matter; liquefied a. boils -33.7°C . and solidifies -75°C . It is readily soluble in water, forming ammonia water (NH_4OH), which may be regarded as containing the ionised radicals, ammonium (NH_4) and hydroxyl (OH), and, owing to the latter, has a strongly alkaline reaction. The group ammonium has not been isolated, but behaves chemically very much in the same way as the alkali metals. The most important salts largely obtained in the manufacture of coal gas are ammonium sulphate, used for the preparation of the numerous other salts and as a fertiliser, ammonium carbonate (sal volatile), and ammonium chloride (sal ammoniac, q.v.). The preparation of ammonia from the nitrogen of the air is an important, but hitherto unsolved, economical problem. Ammonia is used in pharmacy, in dyeing, in the soda-manufacturing process, and in ice-making.

AMMONIACUM, gum exuded from the stem of *Dorema ammoniacum*, a herb of the order *Umbelliferae* of Persia and the Punjab; collected in brownish tears of a faint odour and bitter taste; used medicinally as an expectorant in cases of chronic bronchial affections.

AMMONITE, name for the more or less spirally coiled shell of the *Ammonoidea*, fossil *Cephalopoda* (q.v.) of the Silurian to Cretaceous era, reaching their greatest development both in numbers and complexity of forms in the Mesozoic.

AMMONITES, Semitic race living E. of the Jordan, who were at continual feud with the Jews until finally subdued by Judas Maccabaeus; principal city was Rabbath-Ammon.

AMMONIUM, the radical NH_4 , which acts like the basic elements sodium and potassium. See **AMMONIA**.

AMMONIUS, HERMIAS (V. cent. A.D.), Gk. philosopher; wrote commentaries on Aristotle, Plato, and Ptolemy.

AMMONIUS, SACCAS (III. cent. B.C.), Gk. philosopher of Alexandria; founded Neo-Platonist School; teacher of Plotinus.

AMMONIUS OF ALEXANDRIA (V. cent.), Egyptian commentator; wrote on the *Psalms* and *St. John's Gospel*, and an exposition on *Acts*.

AMMUNITION, military term for explosives, propellants, projectiles, cartridges, igniting apparatus, and accessories for ordnance and small arms. Machine-gun and small arms a. essentially consists of a drawn brass cylindrical cartridge containing the propellant (e.g. cordite), the elongated, rounded, or conical bullet of lead, sometimes covered with nickel, and the percussion cap containing fulminating powder ($\text{Hg}(\text{ONC})_2 \cdot \frac{1}{2}\text{H}_2\text{O}$) in the centre of the cartridge base (central fire). The latter is provided with a rim to keep it in place

in the breech and to facilitate the withdrawal or ejection of the case after firing. For shot-guns the case is usually made of a special kind of paper, only the base being of brass. The rim-fire cartridge is now practically obsolete. The development of ordnance, a., and armour-plates has proceeded hand in hand, and the introduction of rifling in guns has considerably modified the character of projectiles.

Cannon-balls have been superseded by shells and armour-piercing projectiles, and grape-shot and chain-shot are no longer used. Spherical shells of cast-iron filled with slow-burning powder ignited by a fuse ignited before being fired from a mortar were abandoned after the Franco-Prussian War, and their place taken by the elongated common shell. The latter are now made of forged steel, and contain a high explosive, e.g. lyddite, which makes them highly destructive on impact, breaking up into large pieces flying forward, and are used chiefly for the attack of buildings. *High explosive shells* are generally filled with lyddite and are fitted with a nose-fuse and exploder, and break up into fine pieces on detonation, which is terribly effective within 25 yds. of the striking-point. *Armour-piercing projectiles* are provided with heads specially hardened. Frequently the point is provided with a cap of soft iron to reduce the 'biting angle' (q.v.). As an example of their penetrating power it may be mentioned that a 46-ton 12-in. gun can drive a shot of 850 lb. through a plate of iron 28.6 in. thick. A *shrapnel shell* has part of its interior filled with bullets, which fly forward when it bursts, and is very effective against troops. Numerous designs of shrapnel, e.g. Krupp's and Ehrhardt's, are now in use in the different armies and navies, mostly fitted with a highly complicated percussion, time combination, or electric fuse. A smoke-producing charge is generally fitted so that the position of the burst can be plainly seen. 'Shooting shrapnels' have a large bursting charge which increases the velocity of the bullets and makes the distribution of the fragments of the shell more dangerous. The principle of packing lead or iron shot in bags contained in an iron case has been used from the early XV. cent. (case-shot).

The supply of a. in the field is the function of the a. column which supplies the brigade and regimental reserves. Small arms a. of the infantry soldier is carried in bandoliers or pouches, the number of rounds depending on the calibre of the rifle (100 rounds for the '303 Lee-Metford), and is supplemented from the regimental reserve. See **ARTILLERY**, **RIFLE**.

AMNESIA, loss of MEMORY (q.v.).

AMNESTY, an Act of the Crown, or the Government, granting a general pardon for rebellion or other offence. Such an Act was passed in Britain after the Jacobite rising of 1745.

AMEBA, genus of rhizopod Protozoa (q.v.), occurring widely in stagnant water, the best-known species being *A. proteus*. It is one of the simplest animals, diameter about $\frac{1}{16}$ in., consisting of a nucleated mass of protoplasm densest in its outer part (ectosarc), and moves, changing its shape, by protruding parts of itself called pseudopodia, which also serve for engulfing food (minute organisms, etc.). Respiration and excretion are carried on by contractile vacuoles. Divided into two sub-orders, *Proteomyxa* (q.v.) and *Lobosa* (q.v.).

AMCEBEAN VERSES, verses in the form of a dialogue, the persons speaking alternately, as in some of Vergil's *Eclogues*.

AMOL ($36^\circ 28' \text{ N.}$, $52^\circ 20' \text{ E.}$), town, Persia. Pop. c. 10,000.

AMONTILLADO, superior quality of light, dry sherry wine.

AMONTONS, GUILLAUME (1663–1705), Fr. scientist; invented a hygrometer, and improved the working of various instruments.

AMOR (classical myth.), another name for the Rom. Cupid, god of love; equivalent to the Gk. Eros.

AMORA, Hebrew term, meaning one who dis-

courses; was applied originally to the rabbis who compiled the Talmud.

AMORITES, Israelitish name applied to early natives of Palestine.

AMORPHOUS, having no definite form; (min.), having no crystalline structure.

AMORT, EUSEBIUS (1692-1775), Ger. theologian and author; a literary Admirable Crichton; said to have been most learned man of his age, and was a writer upon a great variety of subjects.

AMORTISATION, originally the disposal of lands in mortmain; latterly the cancelling of a debt within a specified time.

AMORY, THOMAS (d. 1788), Eng. author and eccentric; wrote the *Life of John Bunce, Esquire* (1756), a medley of fiction, theol., and autobiography.

AMOS (VIII. cent. B.C.), Hebrew 'minor prophet'; shepherd by occupation; believed to have been the first prophet to commit his prophecies to writing.

AMOY (24° 34' N., 118° 10' E.), town and island, China; fortified; fine harbour; open to foreigners; trading centre; exports tea, sugar, etc. Pop. (town) c. 120,000.

AMPELIUS, LUCIUS (III. cent. A.D.), compiled history of the world to reign of Trajan.

AMPELOPSIS, VIRGINIA CREEPER, ornamental climbing plant related to the grape-vine, with tendrils ending in adhesive disks.

AMPÈRE, ANDRÉ MARIE (1775-1836), Fr. physicist; b. Lyons; prof. of Physics at Bourg, Lyons, the Polytechnic School at Paris, and the Collège de France; discovered the relations between electricity and magnetism and developed the science of electro-dynamics (electro-magnetism). The unit of electrical current is called after him, the *Ampère*. See AMPÈREMETER.

AMPÈRE, JEAN JACQUES (1800-64), Fr. scholar; s. of André Marie A.; wrote on Scandinavian and Ger. poetry, etc.

AMPÈREMETER, AMMETER, instrument for measuring the amount of electric currents in ampères; an ampère being the current of one volt under resistance of one ohm, or depositing 0.001118 grams of silver per second from a standard solution of silver nitrate. The thermal a. essentially depends on the registration of the sag of a wire owing to its increase of length due to the increase of temperature created by the current. Electro-dynamics a., or electro-dynamometer, is constructed on the principle that a fixed wire coil carrying an electric current will displace a second coil suspended by twisted silk fibres. The angle of torsion indicates the strength of the current passed through the coils, the apparatus being standardised by passing through known currents. Another type of a. depends on the influence of a magnetic field on a charged coil of wire, and is generally termed an electro-magnetic ammeter. Lord Kelvin's ampère balance has also found extensive use, and many different types are constructed for different purposes.

AMPHIARAUS (classical myth.), famous seer of Argos; joined Argonauts and Seven against Thebes; saved from death by Zeus, and immortalised.

AMPHIBIA (zool.), term introduced by Linnaeus for a class of animals including snakes, turtles, frogs, salamanders, and lizards, modified by Cuvier and Brongniart, who recognised the differences between frogs and salamanders and the Reptilia. Huxley united amphibians (Batrachia) and fishes in the division Ichthyopsida, and reptiles and birds as Sauropsida. The term A. is now usually replaced by Batrachia (q.v.).

AMPHIBOLE, group of rock-forming minerals allied to the pyroxene group, but differing from the latter in cleavage and optical characters. The amphiboles are calcium, magnesium, or aluminium silicates with iron or other metals; and they include hornblende, tremolite, actinolite, glaucophane, crocidolite, and other minerals.

AMPHIBOLITE, term for a metamorphic rock

consisting essentially of amphibole (hornblende), when schistose called hornblende schist, containing divers accessory minerals, e.g. feldspars, iron oxide, biotite, etc. Owing to its different modes of origin and structural character representing different stages of metamorphism, a. cannot be strictly defined.

AMPHIBRACH, metrical foot of one long between two short syllables, thus: u-u.

AMPHICTYONY, celebrated federal council of ancient Greece, associated with a shrine, the temporal affairs of which were in its charge. The members were chosen from the principal neighbouring tribes, and there were such councils at Delos, Argos, and, most famous of all, at Delphi.

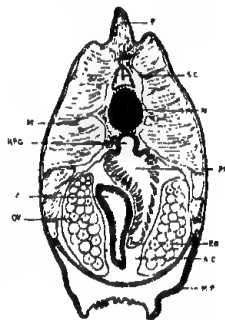
AMPHILOCHUS (classical myth.), famous seer; took part in Trojan War; part-founder of oracle of Mallos.

AMPHIMACER, metrical foot of one short between two long syllables, thus: - u -.

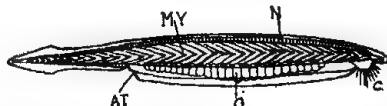
AMPHION AND ZETHUS (classical myth.), twin sons of Zeus and Antiope; Amphion became king of Thebes, and was devoted to music and poetry. When he was engaged in enclosing the city, huge stones moved into their proper places at the sound of his lyre. Zethus was devoted to archery and the chase.

AMPHIOXUS, LANCELET, widely distributed marine animal between 1½ and 3 in. in length, some-

what fish-like in appearance, and inhabiting shallow water (c. 2 fathoms) with a sandy bottom. Its structure is of extreme interest, as it exhibits numerous affinities with vertebrates, of whom it may be regarded as a primitive, though degenerate offshoot. About sixteen species are included in the sub-phylum Cephalochorda (Acrania, Pharyngobranchii) of the phylum Chordata. A. is faintly flesh-coloured and translucent, pointed at both ends with a dorsal median fin and two metapleural folds ventrally, and has 62 V-shaped muscular segments (myotomes). The rigidity of the body is maintained by a dorsal rod notochord composed of turgid cells surrounded by a sheath running from tip to tip. A dorsal tubular nerve-cord without a definite brain lies above it. The mouth is overhung by a hood bearing a fringe of 'cirri' and a 'velum' for wafting in the food. The walls of the gullet are perforated by numerous gill slits, and the water is ejected through the 'atriopore' in the 36th myotome, while the food is wafted along ciliated grooves through the straight intestine to the anus situated near the



CROSS SECTION OF AMPHIOXUS. F, dorsal fin; SC, spinal cord; N, notochord; PH, pharynx; EN, endostyle; AC, atrial cavity; MP, metapleural folds; O, ovary; C, caecum; HPG, hyperpharyngeal groove; M, muscles.



EXTERNAL VIEW OF AMPHIOXUS. C, cirri round entrance to mouth; G, gonads; AT, atriopore; MY, myotomes; N, notochord.

atriopore. The only known sense-organs are sensory cells in the epidermis. There is a rhythmically contractile branchial artery with colourless blood, instead of a heart. Excretion is carried on by a complex arrangement of about 90 pairs of 'nephridia' situated in the wall of the pharynx. The sexes are separate and the ductless gonads (ovaries and testes) are arranged in 28 pairs of sacs along the ventral side of the body. The development is of great theoretical interest. See ANIMALS.—*Cambridge Natural History*, vol. vii.

AMPHIPODA, see MALACOSTRACA.

AMPHIPOLIS (40° 55' N., 23° 58' E.), ancient town, Macedonia, mentioned in *Acts* 17; modern Yenî Kenî.

AMPHISBENA, Gk. name of fabulous serpent, supposed to have head at both ends of body.

AMPHISSA, SALONA (38° 32' N., 22° 10' E.), town, capital of Phocis, Greece.

AMPHITHEATRE (Gk. *amphi*, all round), spacious building, generally oval in form, used by the Romans for gladiatorial combats and other spectacles, the interior being encircled by tiers of seats; open space in centre was called the *arena* (name derived from the sand with which it was strewn). The most famous a. is the Colosseum at Rome, begun by Vespasian, and finished by Titus 80 A.D. It covers five acres of ground; held 87,000 spectators; and is the largest structure of its kind, and the best preserved. Other fine Roman a's are to be seen at Verona, Nîmes, Arles, etc.

AMPHITRITE (classical myth.), dau. of Nereus (Oceanus) and wife of Poseidon; name also used for *SEIL*.

AMPHITRYON, king of Tiryns, husband of Alomene, who became the mother of Iphicles and Hercules.

AMPHORA, large two-handled vessel, usually of earthenware, used by Greeks and Romans for holding wine, oil, etc.

AMPLEPUIS (45° 55' N., 4° 18' E.), town, Rhône, France; thread. Pop. 7000.

AMPLITUDE (physics), the extent of a vibratory movement (e.g. wave or pendulum) measured from the mean position to an extreme; (math's), angle determining the value of elliptic functions; (astron.), the complement of azimuth; also the arc of the horizon between the magnetic west or east point and a heavenly body.

AMPTHILL (52° 2' N., 0° 20' W.), town, Bedfordshire, England.

AMPTHILL, ARTHUR OLIVER VILLIERS RUSSELL, 2ND BARON (1869–), Eng. statesman; noted Oxford rowing man; private sec. to Mr. Chamberlain when Colonial Sec.; gov. of Madras (1899–1906); acting Indian Viceroy during Lord Curzon's absence (1904).

AMPTHILL, 1ST BARON, ODO WILLIAM LEOPOLD RUSSELL (1820–84), diplomatist; attaché to embassies of Paris, Vienna, Constantinople; Sec. of Legation at Rome for twelve years; Assistant Under-Sec. of State for Foreign Affairs (1870); late ambassador at Berlin; cr. Baron A. (1881).

AMPULLA, small vase for holding oils or perfumes used in rituals, coronation ceremonies, etc.

AMRAOTI (20° 55' N., 77° 45' E.), town, Berar, India; cotton. Pop. 34,216; district, 800,000.

AMRAVATI (16° 30' N., 80° 18' E.), ruined town, Madras, India.

AMRELI (21° 36' N., 71° 15' E.), walled town, Baroda, Gujarat, India.

'AMR-IBN-EL-ASS (d. 664), famous Saracen warrior; served under Abu Bekr during invasion of Syria; besieged Jerusalem, Caesarea, and Babylon; sometime gov. of E.

AMRILKAIS, IMRU UL KAIS (c. VI. cent.), most noted Arabian poet of pre-Islamic period; see Ahlwardt's *Six Ancient Arabic Poets* (London, 1870).

AMRITSAR (31° 43' N., 74° 53' E.), town, Punjab, India; religious centre of Sikhs; has Golden Temple; ivory work; silks, shawls, etc. Pop. (1911) 152,866. District produces cereals. Pop. 1,023,828.

AMROHA (28° 55' N., 78° 26' E.), town, United Provinces, India. Pop. 40,077.

AMRUM (54° 40' N., 8° 20' E.), island, North Sea, Germany. Pop. 900.

AMSDORF, NICOLAUS VON (1483–1565). Ger. Prot. reformer; friend of Luther; did much to further the Reformation; was associated with foundation of Jena Univ.

AMSLER, SAMUEL (1791–1849), Swiss engraver; very successful in reproducing work of Raphael.

AMSTAG (46° 46' N., 8° 39' E.), village, Uri, Switzerland; ruined castle.

AMSTELODAMUM (52° 22' N., 4° 53' E.), 'dam of the Amstel,' Latinised form of Amsterdam.

AMSTERDAM (52° 22' N., 4° 53' E.), capital, Netherlands; situated at junction of Amstel and IJ; great commercial centre; connected with North Sea by Canal, opened 1876; intersected by numerous canals; houses built on piles; extensive harbour. A. has palace, two univ's, fine library, many churches, zoological and botanical gardens. Museums have important art collections. Originally fishing village, A. developed from XVI. cent., especially after closing of Scheldt by Treaty of Westphalia, 1648, which destroyed trade of Antwerp; became capital of Netherlands under Louis Bonaparte, 1808. A. exports Dutch produce, butter, cheese, oil, etc.; industries include diamond-cutting, sugar, soap, and tobacco works, shipbuilding, distilling, brewing, glass-works. Pop. (1909) 570,000.

AMSTERDAM (37° 47' S., 77° 34' E.), island, Ind. Ocean; uninhabited; French.

AMSTERDAM (42° 57' N., 74° 15' W.), town, New York. Pop. (1910) 31,267.

AMU DARIA, JIHUN (41° N., 62° E.), large river, Russ. Turkestan; rises in Pamir plateau; enters Sea of Aral; irrigates Khiva plains; ancient Oxus.

AMULET, charm, or talisman, generally worn round neck to protect wearer against sickness, witchcraft, or other evils; of very ancient use; herbs, animal-matter, and various substances are used.

AMUNDSEN, ROALD (1870–), Nor. explorer; conducted oceanographical investigations in North Atlantic; first man to navigate N.W. Passage, 1906; projected new seven years' Arctic expedition, with Nansen's ship *Fram*, but made dash instead for South Pole, which was reached for first time, Dec. 14–16, 1911; see Amundsen, *The South Pole* (2 vols., 1912).

AMUR, AMOOR (51° 30' N., 126° 45' E.), the 'Great River' (about 3000 miles), Siberia and China; enters Sea of Okhotsk; fertile basin; partly navigable.

AMUR (52° 30' N., 129° 15' E.), province, E. Siberia; crossed by Great and Little Khingan and Stanovoi ranges; produces gold; town, Blagovyeschensk. Pop. c. 200,000.

AMURNATH, cave in mountains of N.E. Cashmere; place of pilgrimage; said to be the dwelling-place of the deity, Siva.

AMYCLÆ, ancient town, Laconia; legendary seat of Tyndareus, reputed f. of Castor and Pollux.

AMYGDALIN (C₂₀H₂₇O₁₁N), white crystalline glucoside isolated from bitter almonds.

AMYGDALITES, see TONSILLITIS.

AMYGDALOID (anat. and geol.), having the shape of an almond.

AMYL ALCOHOLS, eight isomeric liquid compounds of the formula C₅H₁₁OH. *Iso amyl alcohol* is a constituent of fusel oil.

AMYL NITRITE (C₅H₁₁NO₂), yellow, oily liquid with characteristic odour, B.P. c. 96°. The inhalation of the vapour causes flushing of the face and palpitation of the heart in consequence of vascular dilatation. Used medicinally to relieve pain in cases of angina pectoris, and to lower the blood pressure in certain other affections.

AMYLOID, a colloidal modification of cellulose, produced by dissolving it in sulphuric acid mixed with half its volume of water, and precipitating with water. So called because it gives blue colour with iodine.

AMYNTAS II. (c. 393 B.C.), king of Macedonia; patron of the arts; f. of Philip of Macedon.

AMYOT, JACQUES (1513–93), Fr. author; became prof. of Gk. and Latin at Bourges; Great Almoner of Charles IX. and bp. of Auxerre; chiefly remembered for fine version of Plutarch's *Lives*,

which was rendered into Eng. by Sir Thomas North, and is supposed to have been used by Shakespeare.

AMYRAUT, MOSES (1596-1664), Jr. Prot. theologian; prof. of Theology at Saumur (1633); shared in the chief controversies on Arminianism and predestination; pub. many controversial and religious books.

ANA (pl.), collection of memorable sayings; anecdotes; literary gossip; first memorable collection of *Ana* was made by Poggio Bracciolini, papal sec. during XV. cent.; among modern collections are Walpoliana, Baconiana, Selden's *Table Talk*.

ANABAPTISTS, name loosely used of several sects which arose in Europe at and after the Reformation. They first appeared at Wittenberg, 1521. Their tenets were partly religious (the rejection of current doctrine Catholic or Reformed) and partly social. They became all-powerful in Münster, 1532-35, and were then cruelly put down. The term 'Anabaptist' was applied later to various reformers, who often did not follow the teaching of those of Münster. Like some mediæval heretics they sought a primitive ideal of apostolic simplicity, and perhaps they can best be described as Christian Socialists.

ANABASIS (401 B.C.), name of Xenophon's narrative of the expedition of Cyrus the younger against Artaxerxes.

ANABLEPS, see under **KILLIFISHES**.

ANABOLISM, constructive metabolism (*q.v.*), process by which foodstuffs are built up into the living matter of the cell. See **ANIMAT.S.**

ANACHEARSIS (600 B.C.), Scythian philosopher; friend of Solon; reputed to have invented the two-fuked anchor.

ANACHRONISM, error in computing time; referring an object or event to a particular period which really belongs to another.

ANACLETUS, or **CLETUS** (78-90), 3rd pope; in some lists of popes the name is made to represent two persons, Cletus and Anacletus, who reigned 3rd and 5th in papal series.

ANACOLUTHON, grammatical term for a sentence in which the construction does not follow an orderly sequence, i.e. in which the latter part does not strictly correspond to the earlier.

ANACONDA (*Eunectes murinus*), S. Amer. snake, of the boa family, said to attain a length of over 30 ft.; inhabits swampy forests, and hides in water to catch mammals or birds.

ANACONDA (46° 3' N., 113° W.), town, Montana, U.S.A. Pop. (1910) 10,134.

ANACREON (b. 560 B.C.), Gk. lyric poet of Teos; friend of Simonides; patronised by Hipparchus; wrote hymns to Artemis and Dionysus, but is chiefly famous for his amatory and bacchanalian lyrics. *Anacreontics*, love lyrics, or drinking songs, supposed to follow the style of A.

ANADYOMENE (Gk. = 'rising from sea'), epithet applied to Aphrodite, who was said to have sprung from the sea-foam.

ANADYR (64° N., 178° 45' W.), gulf, Siberia.

ANADYR (66° 5' N., 168° 50' E.), river, Siberia.

ANÆMIA, a general term applied to blood diseases in which there is either a diminution in the normal number of the corpuscles of the blood (*q.v.*) or in the amount of hæmoglobin in each corpuscle. A's are classed as primary a's or secondary a's, the first including chlorosis and pernicious a., of which causes have not yet been discovered, and the secondary a's due to excessive bleeding, malignant growths, intestinal parasites, etc., which cause derangement of the normal supply or destruction of red blood corpuscles.

Chlorosis occurs in young women from 15 to 25, with headache, difficulty in breathing on alight exertion, palpitation, and often menstrual disturbances. The skin usually has a greenish colour, and the lips, gums, and conjunctivæ of the eyes are pale. There is not any diminution in the number of red blood

corpuscles, but the hæmoglobin they contain is greatly decreased and the corpuscles are pale in colour. The cause has been suggested to be congenital narrowing of the aorta, chronic constipation, and a variety of other things. The treatment is to correct constipation or other digestive disorders, take gentle exercise and plenty of fresh air, and iron increasing in amount weekly, for three months at least.

Pernicious anæmia is a very fatal disease, affecting males rather than females. There is general weakness, tiredness, palpitation, difficulty in breathing, sometimes irregular rise of temperature; pains in the stomach, vomiting and diarrhoea; bad teeth and suppurating gums are often associated; there may be little hæmorrhages into the skin and other organs; while the whole of the skin is of a characteristic lemon-yellow colour. The blood corpuscles are much reduced in number and exhibit diverse changes in shape, while very large nucleated red corpuscles are present in the blood. Progress is slow, the patient rallies from time to time, but the end is almost invariably fatal in about a year and a half. The cause is now believed to be connected with a septic condition of the gastro-intestinal tract, due, e.g., to bad teeth or a similar reason. The treatment is complete rest, milk foods, arsenic in increasing quantity, and perhaps intestinal antiseptics, e.g. salol. Blood transfusion and antistreptococcus serum have been tried with some success.

ANÆROBES, see **BACTERIOLOGY**.

ANÆSTHESIA, a state of insensibility to pain, either general or local, produced in med. by substances termed *anæsthetics*. Anæsthetics of one kind or another seem to have been employed from very early times. In 1844 Wells, an Amer. dentist, introduced nitrous oxide as an anæsthetic in dentistry, and two years later Morton, another Amer. dentist, commenced the use of ether as an anæsthetic. The modern development of anæsthetics dates from 1847 when Sir James Young Simpson of Edinburgh first employed ether and later in the same year chloroform in the practice of midwifery.

At the present day a variety of anæsthetics are in use. *Nitrous oxide* or nitrous oxide mixed with oxygen has a short induction period and is usually unaccompanied by nausea; and it is employed most usually in dentistry. *Chloroform* and *ether* are commonly used in surgical operations, either by themselves or mixed, and it is a matter of discussion which is better. Ether, which is used either by the 'close' or 'open' method, is more apt to cause nausea and vomiting on recovery, but it is generally a safer anæsthetic with a less experienced anæsthetist; in operations about the face where a closely fitting mask is impracticable, in children and elderly people, and also in midwifery, chloroform is the better.

Ethyl chloride is a useful anæsthetic in minor operations, and to induce anæsthesia before chloroform, and is becoming more and more used. In operations covering a limited and superficial area local a. may be applied, by spraying the part to be operated upon, with ether or ethyl chloride, or by injecting a local anæsthetic into the subcutaneous tissues, into a nerve trunk, or into the sub-arachnoid space of the spine. *Cocain* and its preparations, *eucain*, *tropacocain*, *novocain*, *stovain*, are commonly thus employed.

ANAGLYPTICS, low relief carving, or embossing.

ANAGNIA (41° 45' N., 13° 10' E.), ancient city, Italy; modern **ANAGNI**; fine old cathedral.

ANAGRAM, word or sentence formed by transposing the letters to form other words; thus, 'file' may be transposed into 'life'; a.-making is of great antiquity.

ANAH, 'ĀNA (34° 25' N., 42° E.), town, Mesopotamia; on Euphrates; produces fruit; manufactures cloth; ruined castle on neighbouring island; early-history unknown; taken by Emperor Julian, 363; ruled by a-mir in XVII. cent.; often attacked by desert Arabs.

ANAHEIM (33° 48' N., 117° 54' W.), town, California. Pop. (1910) 2828.

ANAHUAC (c. 19° 35' N., 100° W.), district, Mexico; formerly had many lakes.

ANAKIM (Sons of Anak), race of giants descended from Arba, who dwelt in S. Canaan; chief city, Hebron (*Numbers 13* and *Joshua 11*).

ANALCITE ($\text{NaAlSi}_3\text{O}_8 + \text{H}_2\text{O}$), colourless to opaque pinkish white mineral of the zeolite group occurring in cavities of basic igneous rocks (e.g. N. Ireland); crystallises in the cubic system.

ANALEMMA, a scale on a terrestrial globe giving sun's declination on any day; in shape a figure 8, reaching across torrid zone.

ANALEPTIC, a restorative.

ANALYST, one skilled in chemical analysis. Public a's are app. by local authorities in connection with the Brit. Food and Drugs Acts.

ANAM, see **ANNAM**.

ANAMALAI HILLS (10° 27' N., 76° 52' E.), mountains, Madras, India.

ANAMBAS ISLANDS (3° 15' N., 106° 20' E.), group of small islands, Malay Archipelago.

ANAMORPHOSIS, a distortion, or deformation, of an image or appearance; such as is produced by reflection in curved mirror.

'ANAN BEN DAVID (VIII. cent.), Persian Jew; founder of Karaites sect, which opposed the rabbinic tradition.

ANANAS, see **PINE-APPLE**.

ANANDA, first cousin and chief disciple of Buddha.

ANANIAS, husband of Sapphira; both punished by Peter with sudden death because of their lying and hypocrisy (*Acts* v. 1-10).

ANANIEV (47° 47' N., 29° 59' E.), small town, Kherson, Russia.

ANANTAPUR (14° 37' N., 77° 20' E.), town, Madras, India. Pop. 7938. Also district. Pop. 788,254.

ANAPA (44° 50' N., 37° 5' E.), port, Russia. Pop. 6676.

ANAPÆST, **ANAPÆST**, metrical foot of two short syllables followed by one long; thus *intèrjice*.

ANARCHISM (Gk. 'without rule'), name given to that form of political theory which objects to all government. 'Anarchist' generally suggests a certain violent type of revolutionary, one of whose methods of bringing about the millennium is to put to a violent death all kings and rulers, and it is this type which, working by means of secret societies, constitutes a menace to society. It is thus theoretically diametrically opposed to Socialism, which would increase rather than diminish the scope of government; but extreme Socialists and anarchists may (and do) for the time join hands to overthrow the existing system which they both consider evil. A., however, may be quite different. Tolstoi was an anarchist in the strict sense. All government according to him was evil, though he advocated non-resistance to evil. A modern state as such was directly tyrannical. In objecting to all organised government he followed some earlier thinkers, though it would seem impossible to reconstruct society (if one could then speak of society at all) on such a basis. Violent a. can almost be called a disease in the body politic, for anarchists seem to be bred in countries which have for cents. suffered from misgovernment, especially, e.g., in Italy. In recent years they have murdered Pres. Carnot, the Empress of Austria, Pres. McKinley, and King Humbert of Italy, besides attempting to kill others. A similar kind of revolutionary in Russia is called 'Nihilist.'

Parsons, *Anarchism*.

ANASTASIUS, 4 popes: I. (399-401); II. (496-98); III. (911-13); IV. (1153-54).

ANASTASIUS I. (c. 430-518). Byzantine emperor; m. Zeno's widow, Ariadne; progressive ruler; excommunicated.

ANASTASIUS II. (d. 721), Byzantine emperor, dethroned by Theodosius.

ANASTOMOSIS (Biol.), the joining of vessels or of several branches of one vessel, frequently forming a network, as in blood-vessels, insect-wings, or leaves.

ANATA (31° 49' N., 35° 15' E.), village, Palestine; birthplace of Jeremiah.

ANATASE, **OCTAHEDRITE** (TiO_2), blue-black or yellowish brown mineral occurring in octahedral or prismatic crystals in cavities in granite, gneiss, and mica-schists of the Western Alps. It is converted into rutile by heating.

ANATHEMA, originally an offering or sacrifice; later an ecclesiastical curse.

ANATOLIA (39° 30' N., 30° E.), province of Asiatic Turkey; former Gk. name for whole of Asia Minor as land of sunrise; A. railway to Persian Gulf is in process of construction. See **ASIA MINOR**.

ANATOMY, term (Gk.) originally meaning dissection or cutting up, now applied to the study of the structure of animals (*zootomy*) and plants (*phylotomy*). *General A.* treats of the structure of the tissues of which the different parts of the body and the organs are composed. *Histology* deals with the study of their microscopical appearances. *Special or Descriptive A.* treats of the different organs and parts in regard to form, special structure, and relations to each other. *Osteology* deals with the bones, *Arthrology* with the ligaments and joints, *Myology* with the muscles, *Neurology* with the brain, spinal cord, and nerves, *Angiology* with the heart, blood-vessels, and lymphatics, *Splanchnology* with the special organs of the body. *Surgical or Topographical A.* refers to the relations of the different regions of the body with special regard to surgical and medical diagnosis and surgical operations, and *Surface and Artistic A.* to the marks on the surface of the body corresponding to the deeper structures, the effects on the superficial appearance of internal structures, and the proportions of the different parts. *Comparative A.* is the study of the relations of the structure of the different animals to one another and to man.

History.—In very ancient times no doubt the priests and others had some knowledge of the structure of animals and human beings, yet even the ideas of Hippocrates (b. 460 B.C.), the father of med., regarding the subject of A. are very vague and incorrect, and the descriptions of human A. in the works of his disciple, Polybus, are quite fanciful and inaccurate. The real founder of the sciences of A. and Zoology was Aristotle (b. 384 B.C.), whose knowledge was considerable and wonderfully accurate, although he seems to have dissected the bodies of animals only, and not of human beings. Erasistratus (c. 350 B.C.) was the first to dissect human bodies, Herophilus gained an extensive knowledge of human A. from dissections, while Celsus (c. 60 B.C.) wrote exhaustively on the subject in his work, *De Medicina*.

Galen (b. 130 A.D.) was the greatest anatomist of ancient times, and he described anatomical structures at length and with much accuracy, gaining his knowledge mainly from the dissection of animals. He was followed by Soranus, Oribasius, and others, but they did not add much to his discoveries. After the time of Galen until the XII. or XIII. cent. the study of A. fell into abeyance, except to a modified extent among Arabian physicians, whose religion, however, would not allow them to touch dead bodies, until the rise of the school of med. at Bologna in the XIII. and XIV. cents., with Mondino as teacher of A. (1315), along with the schools at Padua and Salerno. After Mondino, who is the founder of the modern science of A., came Guy de Chauliac, Matthew de Gradibus (1480), Gabriel de Zerbis (1490), Achillini of Bologna (1512), and Berenger of Carpi (1500), who made many important observations. The Fr. school of anatomists followed the Italian, Dubois or Sylvius (1555), Etienne (1564), and Vesalius (1564) being its leaders, the last-named being one of the greatest of modern anatomists. Eustachius (1552) made important discoveries, which unfortunately were not

communicated to the world until two centuries later; while Columbus, Fallopius, Massa, Aranzi, Variolius, Fabricius, and Servetus are all illustrious anatomists of this period.

The science of A. made great progress in the XVII. cent., Harvey, in 1619, discovering the circulation of the blood, Aselli, in 1627, the lacteal vessels, the difference between which and the lymphatics was shown by Joyliffe and Rudbeck about 1652. Willis conducted valuable researches on the brain and nerves, while Wharton, Malpighi, Ruysch, and Duverney investigated different important organs and structures. In the succeeding cent. there was no diminution of the labours of anatomists, and attention was now given to the science of Comparative A., which had been neglected when anatomists began to be able to conduct dissections on the human body as well as upon animals, Perrault, Pecquet, and Duverney in France, and Tyson, Grew, and Collins in England, doing valuable work in this branch of science. Italy began again to produce eminent anatomists, Valsalva, Mascagni, Pacchioni, Santorini, and Morgagni (who was practically the founder of Pathology) flourishing at this period; while in Britain, Cowper, William Hunter, John Hunter, Henson, Cruikshank, Monro *primus*, and Monro *secundus*; in France, Winslow, Vieq d'Azyr, and Richât; in Holland, Boerhaave, Albinus, Bonn, and Camper; in Germany, Haller, Meckel, and Sömmerring—all developed the knowledge of A., and in the closing years of the XVIII. cent. and the beginning of the XIX. the science had attained to a high standard of exactness.

In Britain at the beginning of the XIX. cent. the most important work pub. on the subject was by Sir Charles Bell, who discovered the difference between sensory and motor nerves, while Fyfe, Monro *tertius*, John Bell, and others wrote valuable systematic works. In 1828 Quain published the first edition of his monumental text-book, which in successive editions and altered by successive authors has occupied a prominent place in the study of A. up to the present time. The first edition of Gray's systematic text-book appeared in 1858, and the work is still, in new editions, widely studied; and in 1902 the exhaustive work edit. by Cunningham was first published. Of the numerous important works on A. pub. in Germany in the XIX. cent. the most valuable are that of Henle, and the very complete work of Bardeleben, while in France Testut and Poirier have issued works of note.

In 1832 and 1871 ANATOMY ACTS were passed in Britain regulating the study of A. and the supply of human bodies, principally owing to the deeds of the Resurrectionists in the early part of the cent., who dug up bodies from newly made graves and sold them to anatomists, to whom no other source of supply was open, the crimes of Burke and Hare in 1828 in Edinburgh bringing the matter prominently before the public. By these Acts four A. inspectors were appointed, for London, England, Scotland, and Ireland, who supervise the supply to medical schools of unclaimed bodies from poorhouses, etc. Body snatching is thought to have persisted in some States of America until the end of XIX. cent., and the laws against it vary in different States.

Various sections of Anatomy are dealt with under: ABDOMEN; ARM; ARTERIES; BLOOD; BONE; BRAIN; CIRCULATORY SYSTEM; CONNECTIVE TISSUES; DIAPHRAGM; DIGESTION; EAR; EYE; FOOT; HAIR; JOINT; KIDNEY; LARYNX; LEG; LIVER; LYMPHATIC SYSTEM; MAMMARY GLAND; MUSCLE; NERVOUS SYSTEM; PANCREAS; RESPIRATORY SYSTEM; REPRODUCTIVE SYSTEM; SKELETON; SKIN; SKULL; SPLEEN; TEETH; THYMUS GLAND; THYROID; URINARY SYSTEM; VEINS.

ANAXAGORAS of Clazomenæ (c. 500–428 B.C.), Gk. philosopher. He was the first philosopher to live in Athens, where he was a friend of Pericles; when Pericles became unpopular, A. was accused of

impiety—according to one account, for calling the sun a red-hot mass—and had to leave the city. His physical speculations tended in the direction of atomism; he is also famous for having introduced the doctrine that Mind or Reason orders the world, but it is uncertain whether he had arrived at the distinction of material and immaterial, or regarded Mind as a kind of matter.

ANAXARCHUS (c. 340 B.C.), Gk. philosopher; friend and mentor of Alexander the Great.

ANAXIMANDER (611–547 B.C.), scientific philosopher of Miletus; pioneer of exact science; said to have introduced sundial into Greece.

ANAXIMENES OF LAMPSACUS (c. 380 B.C.), Gk. historian and rhetorician; friend of Alexander the Great; opposed to the school of Isocrates.

ANAXIMENES OF MILETUS (d. c. 500 B.C.), Gk. philosopher of Ionic school; held that air is the origin of all life and matter.

ANAZARBUS (37° 18' N., 36° 5' E.), ancient town, Cilicia; destroyed by crusaders.

ANBAR (c. 33° 22' N., 43° 49' E.), town, Mesopotamia; ruins remain.

ANCACHS (9° 50' S., 77° 20' W.), province, Peru. Pop. 317,000.

ANCEUS (classical myth.), s. of Zeus or Poseidon; steersman of the *Argo*; laid down cup of wine to chase a boar, which killed him, thus fulfilling words of soothsayer, 'There's many a slip 'twixt cup and the lip.'

ANCASTER AND KESTIVEN, DUKEDOM or, title originally held by Bertie family, but now in abeyance; 23rd Baron Willoughby de Eresby or. Earl of A. (1898).

ANCELOT, JACQUES ARSÈNE FRANÇOIS POLYCARPE (1794–1854), Fr. poet and dramatist; wrote *Warwick, Louis IX., Elisabeth d'Angleterre*, etc. His wife, MARGUERITE CHARDON (1792–1875), was also a writer of distinction.

ANCENIS (47° 22' N., 1° 10' W.), town, on Loire, France; grain, wine. Pop. 5000.

ANCESTOR-WORSHIP, held by Herbert Spencer to have been the foundation of all religions; springs from the conception of a soul animating a body during life, and, after death, continuing in the unseen the life begun here. Thus with the Romans the word *manes* stood for the friendly spirits of the household, and it was the duty of male descendants to offer food and sacrifices to them. On festival occasions small images, called *Lares*, crowned with garlands, were placed around the hearth-stone, of which they were considered to be the unseen, but not less powerful, guardians. Similarly the Amer. Indians, and other primitive races, look to the spirits of their dead ancestors to further their success in battle. It is the dominant religion in China at the present day, and the 'spirit-tablets' found in the living-rooms of Chin. houses, inscribed with the names of dead ancestors, are supposed to be tenanted by their spirits.

Tylor's *Primitive Culture*; Spencer's *Principles of Sociology*.

ANCHISES (classical myth.), Trojan hero; s. of Capys and Themis. Aphrodite became enamoured of his beauty, and bore him *Æneas*. *Æneas* carried him on his shoulders, fleeing from burning Troy.

ANCHITHERIUM, a fossil ungulate mammal. See under HORSE FAMILY.

ANCHOR, appliance attached to a vessel by a cable and fixed to the bottom of the sea, river, or lake, thus holding the vessel in a particular place. Originally, and now in various localities, heavy weights such as stones were used. But since the use of iron became universal the popular form of a., with two branching arms ending in flukes for hooking fast, has persisted. They usually have a transverse stock to prevent the a. from becoming useless through dragging without fouling. Heavy patent stockless a.s of steel, in which the arms are pivoted and the flukes are side by side, are now much used on large

vessels, e.g. men-of-war. Other kinds are the grapnel for small boats, the screw a. and mushroom a. for permanent moorings.

ANCHOR ICE is that formed in a river-bed while the upper water continues to flow.

ANCHORITE, see HERMIT.

ANCHORITE ISLAND, one of chief islands of Bismarck Archipelago.

ANCHOVY (*Engraulidae*), family of herring-like fishes attaining a maximum length of 8 in., caught in the Mediterranean, off the Dutch coast, and in N. America, and pickled for consumption.

ANCIEN RÉGIME (ancient rule), Fr. government before Revolution, 1789.

ANCIENT DEMESNE, land retained by crown in its own hands at time of Domesday Book; when subsequently alienated, grantee enjoyed special rights.

ANCIENT HISTORY, period commencing with earliest knowledge of existence of man, and ending, by hist. convention, with temporary fall of civilisation when Western Rom. empire came to an end, 476 A.D. The preceding period is **PREHISTORIC**, a term which has altered in meaning of late years; the ages before beginning of definite records used to be considered the field of archaeology as opposed to pure history; now, however, that history has been established as a science, archaeological evidence is essentially history. Ethnologists divide history into eolithic, palæolithic, neolithic, bronze, and iron ages, that is, into Stone and Metal Ages, discovery of metals forming great epoch in civilisation. Australian aborigines, Amer. Indians, etc., are still in Stone Ages, but central stream of human events has left them behind as period of history. The date of appearance of Eolithic ('earliest stone-work') man has been questioned; he possibly existed in geological Tertiary Period, but the 'eolithic' remains discovered in Kent and at Baalbek may belong to Quaternary Period, and it is still doubtful whether those supposed implements are not merely natural products.

Palæolithic Period falls in Second Ice Age, when mammoth, rhinoceros, reindeer, etc., roamed in northern and central Europe, human race definitely appeared and cave drawings, evidence of rudimentary art, were made. The Neolithic Age, marked by similar climate, fauna, and flora to that of later times, closed, 4000-2000 B.C. (the first bronze objects known date from c. 3000).

In the ordinary curriculum A. H. comprises the history of Egypt, Assyria, Babylonia, Persia, China, Greece, Macedonia, and Rome.

ANCIENT LIGHTS, legal phrase referring to the right to unobstructed light. It is determined, in general way, under Prescription Act (1832), that a building having had use of a glass-light for full period of 20 years, the right thereto shall be deemed absolute.

ANCILIA, twelve sacred shields borne in procession by the Romans; one was said to have been sent from heaven.

ANCILLON, CHARLES (1650-1715), Fr. lawyer and historian; left France after vainly endeavouring to secure repeal of Edict of Nantes and became trusted minister of elector of Brandenburg, who app. him historiographer, 1699.

ANCILLON, JOHANN PETER FRIEDRICH (1760-1837), Prussian statesman and writer; grandson of Charles A. (q.v.); tutored and exercised great influence on Frederick William IV.; wrote on political philosophy.

ANCON, in anat. the elbow; in arch. projecting brackets to support a cornice.

ANCON (11° 30' S., 77° 5' W.), bathing resort, Peru. Pop. 3000.

ANCONA (43° 37' N., 13° 30' E.), Adriatic seaport, capital of province of ANCONA, Italy; Rom. Arch. of Triumph and mole; Romanesque cathedral, fine Gothic churches; good harbour; exports calcium carbide, silk, eggs; iron, soap, and sugar works. Pop. (1911) 63,000; province, 319,000.

ANCRE, BARON DE LUSSIGNY, MARSHAL D' (d. 1617), Ital. adventurer; went to France and rose to be marshal and minister of state; notorious for his profligacy; assassinated at instance of Louis XIII.

ANCREN RIWLE, work in Middle English, written probably about 1150-1200, containing spiritual and practical directions for monastic life.

ANGRUM (55° 31' N., 2° 35' W.), village, Roxburghshire; English defeated by Scots at A. Moor, 1545.

ANCUS MARCIUS (c. 640-616 B.C.), 4th king of Rome, grandson of Numa; extended the city, and founded Ostia.

ANCYLOPODA, sub-order of extinct (Miocene and Pliocene) ungulate mammals with limbs resembling those of edentates. *Chalicotherium* is a typical species.

ANCYRA (39° 55' N., 33° E.), old city, Galatia, Asia Minor; occupied by Romans, 189 B.C.; marble temple, Augusteum, engraved with famous inscription recording life of Augustus, known as *Monumentum Ancyranum*; modern **ANGORA** (q.v.).

ANDAGOYA, PASCUAL DE (1495-1548), Span. geographer and administrator; gov. of New Castile; founded Buenaventura; travels trans. and pub. by Hakluyt Soc.

ANDALUSIA (37° 30' N., 4° 30' W.), old province, Spain; watered by Guadalquivir; mountainous in N. and S.; highest peaks, Mulhacen and Peleta; sherry, silk, fruit, copper, lead; chief towns, Seville, Malaga, Granada, Cadiz; successively invaded by Carthaginians, Romans, Vandals, Goths, Moors. Pop. 3,563,600.

ANDALUSIAN SCHOOL, Span. school of painting established at Seville during XVI. cent., with which Murillo was subsequently identified.

ANDALUSITE (Al₂SiO₅), hard, transparent, or greyish mineral crystallising in square prisms and occurring in altered clay or crystalline schists. A variation, *chiasolite* or cross-stone, is used as an amulet, a transverse section showing a black cross on a greyish ground.

ANDAMAN ISLANDS (12° 26' N., 92° 22' E.), two groups, Great A. and little A., Bay of Bengal; number some 200; largest: North, Middle, and South A.; area, 2508 sq. miles. Surface is hilly; highest peak, Saddle Peak, North A. (2400 ft.); no rivers; many bays have beautiful coral beds; coasts indented; principal harbours, Port Blair, Elphinstone Harbour, Stewart Sound, Port Cornwallis, Port Anson, Port Campbell. Islands form part of submerged mountain system; oldest rocks are tertiary and cretaceous. Climate is tropical; products, tea, coffee, timber, sugar, nuts, aloes, etc.; fauna includes turtles, bats, wild-cats, pigs. Natives (c. 2000) are Negroid savages of small stature; there are twelve tribes, each divided into septa. Bengal government established penal colony on islands, 1789-96. Ind. government has had convict settlement at Port Blair since 1858; convict pop. (1911) 12,000. A. is mentioned in Arab documents of IX. cent.; various early travellers, from Marco Polo onwards, describe the islanders' cannibalistic propensities. Portman, *Records of Andamanese* (1893-98).

ANDANTE, musical term for a moderately slow movement, somewhat quicker than *larghetto*, somewhat slower than *andantino*.

ANDELYS, LES (49° 14' N., 1° 24' E.), town, Eure, France; composed of Great and Little A., former noted for interesting XIII.-cent. church, latter for vicinity to old Château Gaillard on Seine, built by Richard I. of England and important in mediæval warfare. Pop. 3925.

ANDENNE (50° 28' N., 5° 7' E.), town, Namur, Belgium; porcelain. Pop. 8000.

ANDERIDA (50° 47' N., 0° 20' E.), old Rom. fort, Pevensy, England.

ANDERLECHT (50° 50' N., 4° 18' E.), suburb, Brussels, Belgium; mills. Pop. (1910) 65,000.

ANDERMATT (46° 38' N., 8° 34' E.), small village, Switzerland; tourist resort.

ANDERNACH (50° 27' N., 7° 23' E.), town, Prussia. Pop. 7889.

ANDERSEN, HANS CHRISTIAN (1805-75), Dan. poet and writer of fairy tales; b. Odense; s. of a poor shoemaker. At the age of fourteen he went to seek his fortune in Copenhagen. He was ugly in appearance, clumsy in manners, and, with little education, he naturally failed in his search for employment, first in the theatres, and later as an operatic singer. After severe struggles he eventually made friends who were able to help him, amongst others being King Frederick VI. Throughout his life he was ambitious to make a reputation as a novelist and dramatist, which hope he never realised. The first series of the famous *Fairy Tales* appeared in 1835, and though he despised their success, he continued to publish instalments of them during the remainder of his life. The subjects of his tales were chiefly suggested by his own experiences, and the *Ugly Duckling* story is said to have been largely autobiographical. A. also wrote travel books and an interesting Autobiography.

ANDERSON (40° 5' N., 85° 40' W.), town, Indiana, U.S.A. Pop. (1910) 22,476.

ANDERSON, ADAM (1692-1765), Scot. economist; clerk in South Sea House; pub. *Historical and Chronological Deduction of the Origin of Commerce* (1762).

ANDERSON, ALEXANDER, 'Surfaceman' (1845-1909), Scot. minor poet; railway surface-man; librarian, Edinburgh Univ., 1905-9.

ANDERSON, SIR EDMUND (1530-1605), Eng. jurist; Lord Chief Justice of the Common Pleas; noted for severity to Catholics and Nonconformists; took part in trials of Edmund Campion, Sir W. Raleigh, and Mary Queen of Scots.

ANDERSON, MRS. ELIZABETH GARRETT (1836-), Eng. physician; pioneer of the movement for the admission of women to the medical profession; developed the New Hospital for Women (London) and its medical school; elected Mayoress of Aldeburgh (1908)—the first woman to hold such office in England.

ANDERSON, SIR GEORGE WILLIAM (1791-1857), Eng. colonial administrator; gov. of Mauritius (1849) and subsequently of Ceylon; noted for administrative reforms.

ANDERSON, JAMES (1739-1808), Scot. agriculturist; invented the 'Scot. plough'; pub. *Inquiry into the Nature of the Corn Laws* (1777).

ANDERSON, JAMES (1662-1728), Scot. author; Postmaster-General for Scotland (1715); wrote several books on Scot. history.

ANDERSON, JOHN (1726-96), Scot. natural philosopher; prof. of Oriental Languages (1756), of Natural Philosophy (1760) at Glasgow Univ.; he furthered the application of science to industry, and bequeathed his property for the foundation of Anderson's College, which developed into the Glasgow and West of Scotland Technical College.

ANDERSON, JOHN (1805-55), Scot. missionary, Madras, India.

ANDERSON, JOSEPH, LL.D. (1832-), Scot. antiquary; keeper of Nat. Museum of Antiqu., Edinburgh; has edit. *Orkneyinga Saga*, Drummond's *Ancient Scottish Weapons*, etc.

ANDERSON, LAURENT (1480-1552), Swed. chancellor and reformer; noted for religious reform.

ANDERSON, MARY (1859-), Amer. actress of great beauty and fine voice; won great popularity in England and America in Shakespearean parts; retired, 1889; m. Antonio de Navarro.

ANDERSON, RICHARD HENRY (1821-79), Amer. general; when Civil War broke out joined Confederate forces, serving under Lee and Longstreet.

ANDERSON, ROBERT (1750-1830), Scot. author and editor; M.D. of St. Andrews; edit. *Works of the British Poets*, with biographical and critical notices (14 vols., 1792-1807), also works of Smollett, Blair,

and other writers, and was the author of a *Life of Samuel Johnson*; LL.D., 1815.

ANDERSON, SIR ROBERT, K.C.B. (1841-), Eng. lawyer and author; was instrumental in bringing about the Parnell Commission; head of Criminal Investigation Dept. (1888-1901); has pub. *Criminals and Crime*, *Sidelights on the Home Rule Movement*, and numerous religious works.

ANDERSON, WILLIAM (1842-1900), Eng. surgeon and art collector; prof. of Surgery at Tokyo; pub. *The Pictorial Arts of Japan and Japanese Wood Engraving*.

ANDERSSON, ADOLF (1818-79), Ger. chess-player; was prize-winner in several international tournaments; author of handbooks on chess.

ANDERSSON, KARL JOHAN (1827-67), Swed. traveller; explored the Kunene River and other parts of Africa; pub. *The Okavango River* and other travel books.

ANDES, LOS.—(1) (32° 58' S., 70° 30' W.) town of Chile, prov. of Aconcagua, S. America. Pop. 4500. (2) (c. 25° S., 67° 30' W.) province of Argentina assigned to her on division of Puna de Atacama, 1899; area, 21,989 sq. m. Pop. c. 2317. (3) (c. 7° 40' N., 72° W.) State of Venezuela; silver mines.

ANDES MOUNTAINS, range extending along Pacific coast, through Peru and Chile, S. America; over 4500 miles in length, between 40 and 400 in breadth; average height, 11,000 ft.; highest peak, Aconcagua (22,800 ft.), ascended by R. Rankin in 1902; gold, silver, precious stones, etc.; home of potato; district of dangerous volcanoes; range crossed by railway completed 1910 by line from Los Andes to top of Cordillera, which meets line from Mendoza.

Fitzgerald, *Highest Andes* (1899).

ANDESINE, mineral, a triclinic plagioclase feldspar intermediate between albite and anorthite, occurring in igneous rocks of S. America.

ANDESITE, group of volcanic rocks, first investigated in the Andes, of porphyritic structure, usually lark brownish grey or green in colour; of varying constitution, they essentially consist of plagioclase feldspar, biotite, augite, and hornblende. They occur not only in America, but in Japan, Philippines, East Indies, New Zealand, and Brit. Isles (Ochils, Cheviots, and part of Lake District).

ANDIJAN, ANDIZHAN (41° 35' N., 71° 55' E.), town, Russ. Turkestan. Pop. 75,000.

ANDKHUI (36° 58' N., 63° 28' E.), town, Afghanistan. Pop. c. 15,000.

ANDOCIDES (b. 440 B.C.), Attic orator; spoke in defence of Eleusinian mysteries, etc.; several speeches still extant.

ANDORRA (42° 32' N., 1° 30' E.), republic, Franco-Span. border; under suzerainty of France, and Span. Bp. of Urgel; Council of 24; area, c. 175 sq. miles; A. obtained autonomy, IX. cent.; suzerainty belonged successively to counts of Urgel, Castello, Foix; subsequently to Bourbon family. A. produces cereals, fruit, vegetables; hot springs; capital, ANDORRA. Pop. 6000.

ANDOVER (51° 12' N., 1° 28' W.), town, Hampshire; agricultural centre; Rom. remains. Pop. (1911) 7596.

ANDOVER (42° 39' N., 71° 9' W.), township, Massachusetts; educational centre. Pop. 6632.

ANDRADA, DIEGO DE PAIVA DE (1528-75), Portug. theologian.

ANDRADA E SILVA, BONIFACIO JOZÉ D' (1785-1838), Brazilian politician; prof. of Geol. at Coimbra (1800); later Minister of Interior and Foreign Affairs.

ANDRAL, GABRIEL (1797-1876), distinguished Fr. pathologist; prof. at Paris Univ.

ANDRASSY, JULIUS, COUNT (1823-90), Hungarian politician; persecuted in early life for his patriotism, he spent some years in Paris and London; returned from exile (1858); made premier (1867);

and thenceforward became dominant figure in Magyar politics.

ANDRÉ, JOHN (1751-80), Eng. soldier; served with distinction in American War of Independence; arrested at West Point and hanged as a spy by American colonists.

ANDRÉ, LOUIS JOSEPH NICOLAS (1838-), Fr. soldier and politician; served with distinction in Franco-Ger. War; Minister of War (1902).

ANDREA DEL SARTO, see SARTO.

ANDREA, JOHANN VALENTIN (1586-1654) Ger. author; in his prose and poetry he lashed the foibles of the day; also wrote hymns and allegorical poems.

ANDREA PISANO (1270-1345), Ital. sculptor and architect; noted for his breaking away from Byzantine influence and traditions.

ANDRÉE, LAURENTIUS (1480-1552), Swed. reformer; chancellor of Gustavus I.

ANDREANI, ANDREA (d. 1623), Ital. wood engraver. Works scarce and much sought after.

ANDREE, KARL (1808-75), and s., **RICHARD A** (1835-), Ger. geographers.

ANDRÉE, SALOMON AUGUST (1854-97 ?), Swed. engineer; started with two companions in a balloon from Spitsbergen, July 1897, in an ill-fated attempt to reach the North Pole.

ANDREINI, FRANCESCO (later XVI. cent.), Ital. actor of great celebrity; wife and s. also famous players.

ANDREINI, GIOVANNI BATTISTA (1578-1650), Ital. poet; his *Adamo* (1613) is believed to have influenced Milton's *Paradise Lost*.

ANDREOSSY, ANTOINE-FRANÇOIS, COMTE (1761-1828), Fr. general; served under Napoleon later raised to dignity of count and made inspector-general of artillery.

ANDREW, APOSTLE, bro. of Peter; first of Christ's disciples; crucified, according to tradition, at Patrae in Achaëa on X-shaped cross (St. A.'s cross); patron saint of Scotland and first evangeliser of Russia; St. A.'s 'day,' Nov. 30.

ANDREW I. (fl. 1046-58), king of Hungary; de throne and murdered for his efforts to introduce Christianity.

ANDREW II. (1175-1235), king of Hungary; pious but reckless, and spendthrift; f. of St. Elizabeth of Hungary.

ANDREW III. (1290-1301), king of Hungary, conducted successful campaigns against the pope and Charles Martel.

ANDREW, JOHN ALBION (1818-67), Amer. politician; gov. of Massachusetts during Civil War, and took prominent part in politics of period.

ANDREW OF LONGJUMEAU (c. 1248), French Dominican explorer; sent by Louis IX. on mission to Mongols; travelled in Syria and Persia; his report to Louis tells of the Mongols' conflicts with Prester John (q.v.).

ANDREWES, LANCELOT (1555-1626), Eng. theologian. Master of Pembroke Hall, Cambridge, 1589; dean of Westminster, 1601; bp. of Chichester, 1605, of Ely, 1609; a scholarly man and fine preacher; wrote *Manual of Private Devotions*; of ascetic habits and deep piety; regarded by many as typical Anglican theologian.

ANDREWS, JAMES PETTIT (1737-97), Eng. historian; wrote *Savages of Europe* (1764); also *History of G. Britain (Henry VIII. to Jas. VI. of S.)*, and other works.

ANDREWS, THOMAS (1813-85), Irish chemist, vice-pres. and prof. of Chem., Queen's College, Belfast, 1845-79; known for his researches on the development of heat in chemical actions, and on the liquefaction of gases.

ANDRIA (41° 11' N., 16° 17' E.), town, Italy. Pop. (1911) 49,967.

ANDRIEUX, FRANÇOIS (1759-1833), Fr. poet and fable and story writer; wrote *Meunier Sans Souci*.

ANDRISCUS (140-148 B.C.), obscure pretender who seized throne of Macedonia.

ANDROCLUS, Rom. slave, in age of Tiberius, who removed a thorn from a lion's foot and was afterwards spared by the same beast in the arena.

ANDROGYNOUS (Gk. *androgynos*, from *andros*, man, *gynē*, woman), having character of both sexes; applied to hermaphrodites of both animals and plants.

ANDROMACHE (classical myth.), wife of Hector of Troy, and mother of Astyanax. Her parting with Hector, who was going into the battle in which he perished, is regarded as the most pathetic passage in Homer's *Iliad*. In the sack of Troy her son was slain before her eyes, and she herself became the spoil of Neoptolemus.

ANDROMEDA (classical myth.), dau. of Cepheus, king of Ethiopia, and his wife Cassiopeia. The latter, having boasted that her beauty surpassed that of the Nereids, Poseidon sent a sea-monster which devastated the country. It was demanded that A. should be sacrificed to appease the deity. She was exposed naked upon a rock by the seashore, but was saved from her horrible fate by Perseus, whose wife she became; after her death turned into a star. Her story has formed the subject of plays by Sophocles, Euripides, and Corneille.

ANDROMEDE, one of a system of meteors which seem to radiate from a point in constellation Andromeda, and are possibly fragments of Biela's comet.

ANDRONICUS I., COMNENUS (c. 1110-85), Byzantine emperor; app. to command in Cilicia (1152); imprisoned for participation in conspiracy against Emperor Manuel (1153); escaped, 1165; subsequently became sole emperor (1183); assassinated. A. was a remarkably talented, but licentious man, a great general, and able politician.

ANDRONICUS II., PALÆOLOGUS (1260-1332), Byzantine emperor; in his time empire was devastated by Turks.

ANDRONICUS III., PALÆOLOGUS (1328-41), Byzantine emperor; dethroned preceding and fought unsuccessfully against Turks.

ANDRONICUS IV. (d. 1385), Byzantine emperor; dethroned his f. and ruled (1377-79), but the latter subsequently recovered his kingdom.

ANDRONICUS, LIVIUS, see LIVIUS ANDRONICUS.

ANDRONICUS OF CYRREUS (fl. c. 100 B.C.), Gk. astronomer; built at Athens an octagonal tower of the winds surmounted by an ornamental vane, the prototype of modern weathercocks.

ANDRONICUS OF RHODES (c. 58 B.C.), peripatetic philosopher who lived at Rome. All his own writings have perished, but he is noteworthy for having made known the works of Aristotle to the Romans.

ANDROPHAGI, Scythian cannibals referred to by Herodotus.

ANDROPOGON, family of coarse perennial grass.

ANDROS (37° 55' N., 24° 54' E.), Gk. island, Cyclades (q.v.). Pop. 18,000.

ANDROS ISLAND (24° 40' N., 78° W.), Bahamas, West Indies. Pop. (1911) 7545.

ANDROS, SIR EDMUND (1637-1714), Eng. colonial official; gov. of New England, Virginia, Guernsey.

ANDROSCOGGIN (44° 28' N., 70° 30' W.), river, Maine, U.S.A.

ANDROTION, Gk. orator, contemporary of Demosthenes.

ANDROUET DU CERCEAU (1515-84), Fr. architect; designed the Pont Neuf, Paris.

ANDÚJAR (38° 4' N., 4° 3' W.), town, on Guadalquivir, Spain. Pop. 16,302.

ANEGADA ISLAND (18° 46' N., 64° 20' W.), one of Virgin Is., West Indies (Leeward group).

ANEL, DOMINIQUE (1679-1730), Fr. surgeon; celebrated for treatment of *fistula lacrymalis*.

ANEMOMETER, wind gauge, instrument for measuring the velocity and pressure of the wind. Robinson's is the best known, though not the most

reliable, a., and consists of four hemispherical cups placed on the end of the arms of a right-angled cross, revolving on a vertical axis connected with recording apparatus. In Lind's or tube a. the wind enters a tube in connection with a vane and the pressure is made to support a column of water. Wind pressure is also measured by letting it act on a square or circular plate with a spring behind. A's are used in mines, gas-wells, etc., as well as in meteorology.

ANEMOPHILY, see POLLINATION.

ANERIO, FELICE (XVI. cent.), Ital. composer; succ. Palestrina as papal composer in 1594. His bro., **Giovanni Francesco A.**, also achieved some fame as a composer.

ANEROID, see BAROMETER.

ANET (48° 50' N., 1° 25' E.), town, France; fine XVI.-cent. château.

ANEURIN (VII. cent.), Welsh bard; author of an epic, *Gododin*; Eng. trans. in Skene's *Four Ancient Books of Wales* (1866).

ANEURISM, a cavity communicating with the interior of an artery, containing blood, usually formed by the dilated or pouched wall of the artery.

ANFRACUOSITIES, tortuous channels formed by erosion (geol.); the sulci of the brain (anat.).

ANGAMOS POINT (23° S., 70° 30' W.), W. coast, Chile.

ANGARA (56° N., 112° E.), river (1200 miles), Siberia.

ANGAREP, African bedstead, consisting of hide stretched across wooden frame.

ANGARIA, name given to a state courier amongst the ancients; in modern law, the seizure of a vessel for public service; the destruction of neutral property by belligerents.

ANGEL (Gk. *angelos*, messenger), term generally used for spiritual beings intermediate between God and man. In Old Testament religion before monotheism became definite, Hebrew 'Elohim' (God) is used of beings inferior to Jahweh. The 'Malakh Jahweh,' 'messenger of the Lord,' is spoken of, but no other mention of a's. Possibly earlier references have been modified by later monotheism. After the Exile Jewish religion was influenced by Zoroastrianism, particularly in angelology and demonology; hence we find a's in *Ezekiel*. A's appear in New Testament. In St. Paul's view a's were created through Christ (*Colossians* 1st). Later Christian thought as regards a's has been much influenced by Pseudo-Dionysius.

ANGEL, Eng. gold coin bearing figure of archangel Michael slaying dragon on the obverse. It was in circulation c. 1465-1634, and was valued at different periods at from 6s. 8d. to 10s.

ANGEL FISH, MONK-FISH, MONGREL SKATE, SHARK-RAY (*Rhina squatina*), a Selachian (q.v.) intermediate between the sharks and rays, with flat body and pectoral fins which project in front, suggesting the top of an angel's wings; length, c. 5 ft.; found in tropical and temperate seas.

ANGELA OF FOLIGNO (1248-1309), an Italian mystic; beatified.

ANGELES, LOS, see LOS ANGELES.

ANGELET, Eng. gold coin worth half an angel.

ANGELICA, genus of Umbelliferous plants; *A. sylvestris* and *A. archangelica*, Brit.; sometimes used in confectionery; formerly considered medicinal. The a. tree of N. America is *Aralia spinosa*.

ANGELICO, FRA (1387-1455), Ital. religious artist; his real Christian name was Guido, Giovanni his religious and assumed name; became a Dominican, 1408; said to have refused archbishopric of Florence; painted in Florence, especially at convent of S. Marco, frescoes which still survive, and in the Vatican at Rome, and elsewhere; a man of very saintly life. His paintings are spiritual and beautiful, but not robust enough for some tastes.

Mason, *Fra Angelico*.

ANGELL, GEORGE THORNDIKE (1823-1909), Amer. philanthropist.

ANGELN (54° 35' N., 9° 45' E.), district, Schleswig-Holstein; original seat of the English (Angles).

ANGELO, MICHAEL, see MICHAELANGELO.

ANGELUS, SILESUS (1624-77), Ger. hymnologist.

ANGELUS, THE, R.C. devotion; at 6 a.m., noon, and 6 p.m. church bells are rung (3 strokes three times, and once 9 strokes), during which antiphons and prayers commemorative of the birth of Christ are said.

ANGERMANLAND (64° N., 17° 30' E.), part of W. Norrland, Sweden; formerly a province.

ANGERMÜNDE (53° 2' N., 14° 1' E.), town, Prussia. Pop. 7600.

ANGERONA (classical myth.), the female patron deity of Rome; her festival (Angeronalia) was celebrated Dec. 21.

ANGERS (47° 27' N., 0° 34' W.), town, France, on Maine; ancient capital of Anjou; fine cathedral; old castle; Catholic Univ.; Episcopal see; birth-place of sculptor David; wine, woollens, cottons, corn, slate. Pop. (1911) 83,800.

ANGERSTEIN, JOHN (1735-1822), celebrated art patron, whose collection of pictures, secured by Brit. Government, served as the nucleus of the National Gallery.

ANGEVIN LINE, Eng. kings from Henry II. to Richard III., of the families of York, Lancaster, and Plantagenet. The name is derived from Henry II., who was s. of Geoffrey, Count of Anjou.

ANGHIARA (43° 30' N., 12° 5' E.), small town, Tuscany, Italy.

ANGHIERA, PIETRO D' (1455-1526), Ital. historian and statesman.

ANGILBERT (d. 814), Frankish poet; Charlemagne's valued servant and constant companion; wrote a number of Latin poems dealing with contemporary events.

ANGINA PECTORIS, sudden paroxysms of pain in the region of the heart, due to disease of the heart, aorta, or coronary arteries; amyl nitrite almost invariably gives relief.

ANGIOLIERI, CECCE (c. 1260-1315), Ital. lyric poet; wrote bacchanalian and amorous poems, remarkable for their humour.

ANGIOSPERMS, the most highly specialised plants, having the seed in a closed ovary in contradistinction to gymnosperms (q.v.). The class includes the majority of flowering plants, and is divided into Monocotyledons (q.v.), and Dicotyledons (q.v.). See PLANTS.

J. Couller and C. J. Chamberlain, *Morphology of Angiosperms* (Chicago, 1903).

ANGKOR (13° 27' N., 103° 50' E.), ruins, Cambodia, Siam, including remarkable temple.

ANGLE, commonly the space between two intersecting straight lines. *Right a.* (90°), when lines form four equal angles; *acute a.*, smaller; *obtuse a.*, larger than right a. (plane geom.); space contained between planes intersecting in one point (solid geom.); *curvilinear a.*, between two curves; and *mixed a.*, between curve and straight line, are determined by a. between tangents at point of intersection. See TRIGONOMETRY.

ANGLER (*Lophius piscatorius*), flattened Teleostean fish of European coasts, preying on small fish and fry. Protective colouring and fringed appendages conceal it effectively among sand and seaweed; a long filament with plate at tip, a modified spine of anterior dorsal fin, lures prey within reach of its large jaws.

ANGLES, see TEUTONIC PEOPLES.

ANGLESEY, ANGLESEA (53° 17' N., 4° 20' W.), county, N.W. Wales; separated from mainland by Menai Strait; surface comparatively flat; lead, copper, zinc; Holyhead, port for Irish service; possessed in turn by Druids, Romans, Irish, Danes, English; area, c. 276 sq. miles. Pop. (1911) 50,943.

ANGLESEY (37° 16' S., 145° 40' E.), county, Victoria, Australia.

ANGLESEY, ARTHUR ANNESLEY, 1ST EARL (1814-86), actively promoted the Restoration; cr. Baron Annesley and Earl of A. in peerage of Gt. Britain (1861); Lord Privy Seal (1873-82); a sane, courageous, and able statesman.

ANGLESEY, HENRY WILLIAM PAGET, 1ST MARQUESS (1768-1854), a s. of Earl of Uxbridge; he led the British cavalry at the battle of Waterloo, and contributed much to the victory; succ. his f. in 1812 as Earl of Uxbridge, and his new title was the reward of his services at Waterloo; Field-Marshal, 1848. As Lord-Lieutenant of Ireland (twice) he gained the affections of the Irish.

ANGLESITE (PbSO_4), mineral, multiform orthorhombic crystals, originated through oxidation of galena; first discovered in Anglesey.

ANGLEUR (50° 42' N., 5° 35' E.), town, on Ourthe canal, Belgium; zinc.

ANGLIA, EAST (Norfolk and Suffolk), territory, settled in 551 by Angles.

ANGLING, the art of catching fish by means of a line and baited hook, is a pursuit of great antiquity, being mentioned in the *Book of Isaiah* and in the *Odyssey* of Homer, while prehistoric fish-hooks of different materials have been found in many widely separated parts of the earth. Its popularity as a sport has increased enormously during the last cent., and legislation now assists the preservation of fish by enforcing close times, while many rivers and lakes are systematically stocked. A. may be considered under the heads of fresh-water a. and sea a. Anglers divide Brit. fresh-water sporting fish into two classes, *salmonides*, salmon, trout, grayling, char; and *coarse fish*, pike, perch, ruffe, carp, tench, bream, barbel, roach, dace, rudd, chub, gudgeon, bleak, minnow, eel. In Scotland the salmon and trout in the streams, and trout, pike, and perch in the lakes, are the only sporting fish that abound, the eel not being considered under that category; and it is in the streams of the Midlands and S. of England that most of the others mentioned above are found. A. is a popular sport also in the Brit. Colonies (in some of which the trout has been acclimatised, while the salmon of N. America are well known), the United States, France, Germany, Austria, and northern Europe generally, and India, where anglers much esteem the mahseer.

Fresh-water a. may be divided into fly-fishing, spinning, and live-baiting, and bottom-fishing. *Fly-fishing* is considered the highest branch of angling, and is the chief manner of a. for *salmonides*; the 'wet-fly,' 'dry-fly,' or 'natural-fly' methods are employed, the first named being the most important. Salmon are usually fished for by the wet-fly method, and the casting and working of the line and fly must be carefully studied. Salmon flies vary in length from half an inch to over 3 inches, and are often of complex structure and wonderful colours. There are many theories regarding what the salmon mistakes them for and why he seizes them, for they resemble neither flies nor any other insects. Certain combinations of colour are more effective than others, and these differ in different streams. Trout-fishing requires even more skill and science than salmon-fishing, and while the wet-fly is still frequently used for trout, the dry-fly method, first practised in the clear chalk-streams of the S. of England, is now much advocated and adopted. The fly is cast on the surface of the water, in imitation of the natural insect, over a rising fish. The natural fly, of which the other two are developments, is hardly used now, except in Ireland.

In *spinning*, a small dead fish or an imitation in metal or gutta-percha is made to revolve on a swivel by pulling it through the water; and in *live-baiting*, a small living fish or frog is put on the hook, both methods attracting fish, e.g. salmon, trout, pike, perch, which prey on the smaller species.

Bottom-fishing, a. for fish feeding on the beds of streams, does not require much skill, a weighted

line suspended by a float being used, the hook baited with worms or one or other of a great diversity of materials.

Sea a. requires stronger tackle than fresh-water a., and is classed in the same divisions as the latter. The fish angled for include bass, pollack, mullet, mackerel, cod, whiting, bream, and occasionally salmon and trout at the mouths of rivers. In America tarpon and tunny, often of enormous size, are sought by sea anglers.

Walton, *Compleat Angler*; Bickerdyke, *The Book of the All-Round Angler* (1900); Sir Edward Grey, *Fly-Fishing* (1907); Hodgson, *How to Fish* (1907).

ANGLOGÆA, term for N. America as far as Mexico.

ANGLOMANIA, term used in France, Germany, and U.S.A. to denote admiration and imitation of things English. Such a tendency was very marked in Germany during XVIII. cent. in regard to Eng. literature, and in France, just before the Revolution, in regard to Eng. free institutions. The same attitude applies at the present day in regard to all forms of outdoor sports.

ANGLO-NORMAN, term used to describe literature, etc., of Normans in England. See **ENGLAND: Literature, Language**.

ANGLOPHILE, to favour Eng. manner or policy; also the person who does so.

ANGLOPHOBIA, person inclined to 'Anglo-phobia,' or the dread and dislike of England, sometimes displayed by continental nations. This regrettable attitude was very manifest during the last Boer War in France, Holland, and Germany.

ANGLO-SAXON, term loosely applied to Teutonic tribes who conquered Britain (V.-VI. cent.); also to their language and lit. as opposed to those of their kinsmen on Continent. Philologists and literary historians prefer term *Old English*. See **ENGLAND: History, Literature**.

ANGLO-SAXON CHRONICLES, name given to a series of six manuscripts, written at various times and in different places, of the first importance as authorities for early Eng. history. They are believed to have been commenced during the IX. cent., were reduced to something like chronological form during the reign of Alfred, and end about 1154. Some of the MSS. contain poems, including the narrative of the famous battle of *Brunanburh* (937).

Thorpe's *Anglo-Saxon Chronicles*, in the 'Rolls Series,' contains the six chronicles and a translation.

ANGLO-SAXON LAWS.—First A.S. code originated in Kent under Ethelbert, and probably resulted from introduction of Christianity. *Wessex* code, framed by Ine, c. 693, throws light on land tenure, money, wergild, etc. Alfred's *Dooms* add new enactments to Ine's, and give details of moots, besides marking changes of social conditions, land tenure, etc., probably caused by Danish invasions.

ANGMAGSALIK (65° 30' N., 39° E.), meteorological and missionary station, E. coast, Greenland.

ANGOLA (13° S., 14° 40' E.), Portug. West Africa; bounded N. and N.E. by Belgian Congo, E. by Barotseland, S. by German S.W. Africa, W. by Atlantic; area, 484,800 sq. miles. Surface consists of low-lying coastal districts separated from plateau of interior by mountain ranges. Chief rivers, Kwanza, Kunene, Katumbela. Interior has considerable amount of forest land. A. produces coffee, rubber, wax, sugar, palm oil, ivory, oxen, fish; minerals include gold, malachite, copper, iron, salt, petroleum; bulk of trade with Portugal; exports coffee, rubber, wax, hides, ivory, copal, gold dust, palm oil; imports textiles, foodstuffs, coal, etc. Principal ports are Loanda (capital), Benguella, Ambriz, Mossamedes, Lobito; railways running inland from Loanda and Benguella, mileage 510; new line from Lobito, to link up with Central African Railways, under construction, over 200 miles already completed. Climate varies; heat modified by trade

winds. Natives are of negroid stock. A. is ruled by 1 gen.; divided into six districts—Congo, Loanda, Iguela, Mossamedes, Huilla, Lunda. There are about 50 government schools, and various missions have been established. Portug. influence was established here in XVI. cent. Pop. c. 5000.

ANGONILAND (14° 30' S., 34° E.), stretch of highlands, E. Central Africa; minerals.

ANGORA (39° 58' N., 32° 41' E.), vilayet, Anatolia, Asiatic Turkey; area, 27,370 sq. miles; goats and mohair; archbishopric; near by Tamerlane defeated Bayazid I., 1402. Pop. 932,800. The capital, Angora, is on site of ancient Ancyra (q.v.). Pop. c. 30,000.

ANGORA (39° 40' N., 33° 40' E.), province. Pop. c. 932,800.

ANGOSTURA (40° 32' S., 63° 49' W.), town and prov. of Argentina, South America.

ANGOSTURA or BOLIVAR (8° 8' N., 63° 57' W.), city, Venezuela, S. America.

ANGOULÈME (45° 39' N., 0° 9' E.), cathedral town, Charente, France; has assize court, theatre, hospitals, museums; manufactures paper, cognac, machinery. Pop. (1911) 38,200.

ANGOULÈME, CHARLES DE VALOIS, DUC D' (1573–1650), illegitimate s. of Fr. King Charles IX.; grand prior of order of Malta (1589); served in Fr. army; received duchy of A. as a legacy (1619).

ANGOULÈME, DUCHESSE D' (1778–1851), Fr. princess; dau. of Louis XVI. and Marie Antoinette; exercised great influence at court of Louis XVIII. and Charles X.

ANGOULÈME, LOUIS ANTOINE DE BOURBON, DUC D' (1775–1844), s. of Charles X. of France; after 1830 abandoned claim to throne; lived in exile.

ANGOUMOIS (45° 30' N., 0° 3' E.), old province, France; capital, ANGOULÈME.

ANGOXÁ, ANGOZA (16° 40' S., 40° 5' E.), coast town, Portug. E. Africa; ground-nuts, rice.

ANGRA, ANORA DO HEROISMO (38° 38' N., 27° 13' W.), capital of Azores, on Terceira Is.; harbour. Pop. 10,788.

ANGRA PEQUENA (26° 37' S., 14° 50' E.), bay, Ger. S.W. Africa.

ANGRI (40° 44' N., 14° 35' W.), town, Salerno, S. Italy; cotton.

ANGSTRÖM, ANDERS JONAS (1814–74), Swed. physicist; authority on optics, pioneer in spectroscopy; Rumford medallist, Royal Society.

ANGUIER, MICHEL (1612–86), Fr. sculptor; executed a group of the Nativity in the Church of Val de Grâce, and numerous public decorations; his bro., François A., was also celebrated as a sculptor.

ANGUILLA, SNAKE IS. (18° 17' N., 63° 5' W.), one of the Leeward Islands, Brit. W. Indies. Area, 35 sq. miles. Pop. 4000.

ANGUILLIDÆ, see EELS.

ANGUISCIOLA, SOFONISBA (1535–1625), Ital. artist; celebrated as portrait-painter both in Italy and Spain; her work exercised marked influence on Van Dyck; examples at Florence, Genoa, Vienna, and Berlin.

ANGUL (20° 40' N., 85° E.), district, Bihar and Orissa, India; minerals.

ANGUS, ancient name of Forfarshire (q.v.), Scotland; breed of cattle.

ANGUS, EARLDOM OF, Scot. title; Celtic line of earls ended with Matilda (XIII. cent.); Norman line (1381); Stewart line with widow of 13th Earl of Mar; her illegitimate s. (fl. 1400), by 1st Earl Douglas, became (1389) 1st Earl of A. in a new line; the 8th earl (c. 1490–1557) m. widow of James IV. of Scotland; their dau. was mother of Lord Darnley; the 8th earl received earldom of Morton (1586), and the 11th earl (1589–1660) was made 1st Marquis of Douglas, whose eldest s. m. Ann, Duchess of Hamilton in her own right, whence the title is now held by Dukes of Hamilton.

ANHALT (51° 47' N., 12° E.), duchy, central

Germany; area, 888 sq. miles; eastern part flat and fertile, watered by Elbe and Saale, produces wheat, flax, rape, hops, tobacco; western part, towards Harz Mountains, has great mineral wealth—lignite, silver, lead, copper, hematite; sugar manufacture, brewing, distilling. Capital, Dessau. Duchy was formed in 1863 by combining duchies of A.-Dessau-Köthen and A.-Bernburg; became Imperial State, 1871. Government is limited monarchy; executive in hands of duke; legislative body, diet of thirty-six members. Pop. (1910) 331,000.

ANHALT-DESSAU, PRINCE OF, see LEOPOLD I.

ANHARMONIC RATIO of four points ABCD on a straight line is the ratio $\frac{AC}{AD} : \frac{BC}{BD}$. Also called cross-ratio.

AN-HUI, see NGAN-HUI.

ANHYDRIDE, an oxide which will combine chemically with water; term generally applied to acidic oxides; e.g. sulphur trioxide is sulphuric anhydride, because it combines with water, forming sulphuric acid.

ANHYDRITE (CaSO₄), calcium sulphate without water of crystallisation, mineral, orthorhombic crystals with three cleavage planes; occurs with gypsum in salt deposits.

ANHYDROUS (=without water), term used to describe the state of a chemical substance freed from water.

ANI (c. 40° 25' N., 42° 50' E.), ancient town, Armenia; ruins remain.

ANICET-BOURGEOIS, AUGUSTE (1806–71), Fr. author; wrote dramas and popular fairy stories.

ANICHE (50° 35' N., 3° 12' E.), town, Nord, France; coal-mines.

ANIE, PIC D' (42° 57' N., 0° 45' W.), sacred peak (8215 ft.), W. Pyrenees.

ANIELLIDÆ, family of snake-like lizards.

ANIENE, ANIO (42° N., 13° E.), river, Rome province, Italy.

ANILINE (Amidobenzene, Phenylamine), C₆H₅NH₂, colourless, malodorous, oily, poisonous liquid; M.P. –8°, B.P. 183°. Resinifies in air, forms salts with mineral acids; its compounds and by-products are of immense commercial value, used in dyeing industry and therapeutics. See DYEING, NITRO-COMPOUNDS.

ANIMAL HEAT, see HEAT.

ANIMAL MAGNETISM, see MESMERISM.

ANIMALCULE, microscopic form of animal life, such as protozoa (q.v.).

ANIMALS.—Living Matter.—It is not possible to say precisely what life is; but it is known that life is dependent on chemical and physical changes associated with a highly complex substance called protoplasm (q.v.). Whether the latter is regarded as being a ferment acting on other less complex substances without being changed itself, or as a labile state of interacting proteids undergoing a constructive and disruptive process (metabolism, q.v.), it is acknowledged that living matter undergoes a ceaseless building up (anabolism) and breaking down (katabolism), and is able to grow by the assimilation of material different from itself. Living matter is organised, i.e. it has a unified behaviour, showing activities such as the power of movement, of sensation, of nutrition (including respiration), of growth, and of reproduction. Organisms consist of one or more unit masses of living matter (cells, q.v.) in which there is either a relative preponderance of anabolic processes manifesting themselves in passivity or of katabolic processes appearing as activity.

Plants and Animals.—The former case is characteristic of plants and the latter of a.s. But, though it is obvious that an oak is a plant and a monkey is an a., it is by no means so apparent that a sponge is an a. and the spherical volvox which gracefully rotates in fresh-water pools is a plant. No hard-and-fast line can be drawn between the simplest a's and the simplest plants. All life is one, and it is

only in types which are differentiated owing to division of labour of the component parts that the divergence of plants and a's becomes obvious. Although there are some notable exceptions, a's differ essentially from plants in being active; in having a more clearly marked division of labour; in feeding only on substances already made by plants or other a's; in not possessing chlorophyll, with which the energy of sunlight is able to reduce carbonic acid gas; and in not possessing cell-walls consisting of cellulose.

Movement.—Apart from the unceasing intracellular, and, in the many-celled a's (Metazoa, *q.v.*), intercellular movement resulting from the chemical processes of metabolism, the power of movement from place to place for the purposes of finding suitable environment and food is effected owing to the contractility of living matter. In many one-celled a's (Protozoa, *q.v.*), *e.g.* the amoeba (*q.v.*), outflowing processes of protoplasm serve for locomotion and engulfing food. In others, although in all Protozoa the single cell performs all the activities of life, definite contractile elements can be distinguished. In some Radiolaria (*q.v.*), the most beautiful of marine Protozoa, these contractile elements are attached to a siliceous skeleton, and serve to increase or decrease the bulk of the a., which can rise or sink in the sea according to conditions of temperature, pressure, etc. Other Protozoa (Infusoria, *q.v.*) are provided with delicate hair-like processes, cilia and flagella (*q.v.*), by means of which locomotion is effected and food particles are wafted towards the a. In another type of Protozoa, the parasitic gregarina (*q.v.*), fibrillar elements striped somewhat like a muscle show contractility, but locomotion is aided by the secretion of a thread of hardening 'jelly' which shores the a. along. In Metazoa the sex-cells (gametes) move in the same way as their protozoan ancestors, either by amoeboid processes or by means of a flagellum, the latter method being characteristic of the male sex-cells (microgametes or spermatozoa) of most a's. Amoeboid cells also occur as white blood corpuscles. The young stages (larvae) of many Metazoa (*e.g.* sponges, echinoderms), swim about actively by means of cilia, while the Ctenophora have comb-like combinations of cilia in the adult state. Ciliated cells occur in most Metazoa (except in insects). The actual movement of many-celled a's is effected by groups of cells which are differentiated from the others as muscular tissue. The muscles of a jelly-fish, of an earth-worm, of an insect, of an octopus, of the limbs and body of a vertebrate, or of the rhythmically contracting heart are examples of contractility of definite cells specialised through division of labour in the a. body. Generally, muscles are attached, both in vertebrates and other a's, to a skeleton which maintains the rigidity of the body, and when external, as in the sea-urchin, also serves for protection.

Skeleton.—The often exceedingly complex 'skeleton' of Foraminifera (*q.v.*) and Radiolaria illustrates the secretion of protective hard substances (calcium carbonate and silica respectively) by Protozoa. Both lime and silica occur as spicules in sponges, and the geological effects of lime formed by a's are demonstrated by the corals. The exoskeletons of echinoderms and the shells of mollusca are also familiar. In Arthropoda (*q.v.*) the exoskeleton consists of a substance called chitin (*q.v.*), while in the sedentary Ascidia (*q.v.*), the thick cuticle or tunic contains cellulose, a unique occurrence among a's. Possibly Balanoglossus (*q.v.*) and apparently Amphioxus (*q.v.*) show a rudiment of the skeleton system of vertebrates in possessing a dorsal axis or notochord. The latter persists in the simplest vertebrates (Cyclostomata, *q.v.*), but in the others is replaced by the backbone during embryonic life. The skull and associated small bones (mandible and hyoid), the backbone or vertebral column and ribs, and the limbs with the pectoral and pelvic girdle form the vertebrate skeleton. It is important to note that the bones as well as the various organs of different vertebrates are similar or homologous, both

as regards development and structure. Thus the foreleg of a lizard, the wing of a bird, the flipper of a whale, and the human arm are homologous, but the wing of a bird and of an insect are structurally and developmentally different, though exercising the same function, and are termed *analogous*.

Sensation.—The Protozoa respond to stimuli, such as change of temperature, touch, chemical reagents, light, electricity—the amoeba, for instance, shrinks from strong light and moves towards food. Sponges, though exceedingly passive, show antipathy to obnoxious substances. In jelly-fish there is a marked division of labour, special areas of cells (nervous epithelium) with 'ganglion' cells and associated with organs sensitive to change of equilibrium control the movements of the a. The sensitiveness of the tentacles of the sea anemone is a well-known phenomenon of the seashore. Except in degenerate parasitic forms, the power of sensation grows more complex according to the progress from simple to highly integrated animals. A nervous system is evolved associated with a definite motor centre or brain capable of receiving sensations of touch, light, sound, and chemical stimuli from the sense organs, of sending 'messages' to the muscular system, and of co-ordinating activities. The complexity of the brain of ants and bees baffles the microscopist, while the nervous system of the stickleback, which carefully constructs a nest to shelter its offspring, is equally wonderful. The courtship, parental activities, and the migration of birds are as yet not capable of interpretation in chemical and physical terms, and as the present knowledge of the anatomy and physiology of the human brain is scanty, there are many who find it necessary to postulate an energy apart from living matter to interpret the nervous activities of organisms, like Aristotle, Beethoven, or Darwin.

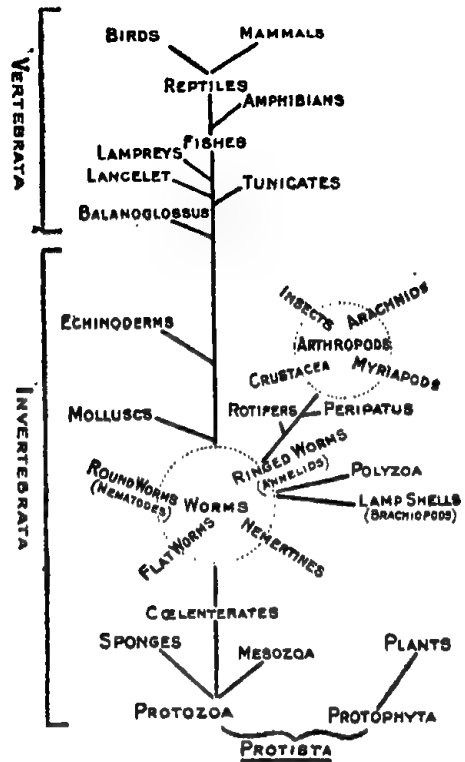
Nutrition.—The expenditure of energy in movement and growth is compensated by the ingestion of food. Some protozoa are able to utilise carbon dioxide, owing to the possession of chlorophyll, in the same manner as plants. The amoeba engulfs and digests food such as algae, and this power of intracellular digestion is shared by some of the cells in sponges and coelentera. In an amoeba and other protozoa the waste products are collected in one or more contractile vacuoles (*q.v.*), and ejected. In the majority of a's, however, the food is broken down into simpler compounds, and rendered soluble in an alimentary canal by the action of certain ferments before being absorbed by the body. Parasites, such as the tape-worm, have no alimentary system, as they absorb the digested food of their host through their body wall. From the tubular gut with digestive cells of a simple type of Coelentera (*q.v.*), like Hydra, there is a growing complexity in the carrying out of the nutritive function according to the division of labour, and at the same time co-operation between the groups of cells concerned. Some kind of jaws for seizing and masticating or sucking food occur in all groups of the a. world, from the 'worms' onwards, and the alimentary canal from mouth to anus becomes more and more associated with various glands (salivary, gastric, pancreas, liver, etc.) and with a circulatory system conveying the products of digestion (*q.v.*) to their destination and the excretory system (nephridia, kidneys). In the vertebrates appears the most highly developed alimentary and circulatory system, which is closely associated with another function essential to a. metabolism, the absorption of oxygen or respiration. To begin again with the Protozoa, an a. like the amoeba absorbs the oxygen dissolved in water, both of which are essential to a. life, on its entire surface. According to the medium in which they live, the breathing apparatus of the 'higher' a's consists of tracheae (insects), gills (molluscs, crustacea, fishes, etc.), lungs (reptiles, birds, mammals), while amphibia (batrachia, *q.v.*), have both gills and lungs at different periods of their life-history.

Growth and Reproduction.—The metabolism of every a. permits of growth up to a certain limit, corresponding to a state of balance. As the bulk of an ameba, for instance, and its surface increase in the ratio of a cube to a square, the point will be reached when the surface becomes relatively too small to absorb sufficient food material. Division takes place, the two resulting cells closely resembling the original cell. Other Protozoa (e.g. *Pelomyxa*) form superficial buds which become liberated, while the Sporozoa (q.v.) divide repeatedly within a cyst, forming spores, often a complex process. It has been observed that after an Infusorian (e.g. *Stylonichia*) has undergone divisions resulting in more than two hundred generations, a marked debility sets in, and the power of nutrition and reproduction comes to a standstill. This 'senile decay,' however, does not occur when individuals of the same species but of a different stock are brought into contact. Two unrelated individuals conjugate, i.e. an interchange of vital material takes place between them, which has the effect of neutralising any variations disastrous to the preservation of the race. This illustrates the importance of sex even in one-celled a's. Many of the simpler Metazoa reproduce asexually by budding (Coelentera) or fission (Turbellaria), but practically all classes develop two kinds of reproductive cells (gametes) either in the same individual (hermaphrodites) or in separate individuals, male and female, producing relatively inert macrogametes or ova and active microgametes or spermatozoa. A macrogamete and microgamete, in a process termed amphimixis, unite to form a cell (zygote), which is the beginning of a new individual. By successive divisions (segmentation) of the zygote an embryo is formed which develops into the adult, frequently in a circuitous manner, as in the 'holometabolic' insects (e.g. moths and butterflies). In some animals (e.g. crustacea and insects) the macrogamete may give rise to a new individual parthenogenetically, i.e. without fertilisation, the drones being a well-known example. Associated with the increasing complexity of structure in each a. group, there is a marked development of the mental functions associated with the care of the offspring (e.g. ants, bees, cephalopods, birds, mammals) and with the co-operation between individuals, finding its most complex expression in man and human society.

Classification.—To obtain a systematic survey of the a. world, it is necessary to group together a's of the same type structurally and developmentally. It would be obviously absurd to classify birds and insects together because they fly, or whales with fishes because they swim and there is some likeness between their tails. Some groups, like echinoderms, are well defined, while worms form a heterogeneous assembly with doubtful homologies. Another difficulty arises when the continuity of life is forgotten in the endeavour to provide each species with a suitable label. 'The imperfection of the geological record' makes it difficult to find 'missing links'; but there is sufficient evidence to show, for instance, that birds are descended from reptiles, that man and monkey sprang from some common stock, that Peripatus links the arthropods with the annelids, that the simplest Metazoa must have arisen from colonies of Protozoa. It is the aim of systematic zool. to discover a classification that will show the relationship between any species, living or fossil, and other species. The following outline of classification tentatively indicates the position of the more important groups, and it must be remembered that to devise a satisfactory model of the 'genealogical tree' it is necessary to make use of all three dimensions. For details of classification, see the articles on the respective classes, e.g. Crustacea, etc.

Distribution.—It is probable that the first fauna may have originated in the 'mud-line' along the coast, and that from there the a's spread and by

natural selection became adapted to the sea and its abysses on one hand and on the other to fresh-water,



terrestrial, and aerial life. The geographical distribution depends on a multitude of factors, the most outstanding being the constitution of the a's and their adaptability to environment, migration, or dispersal from an original home and geological changes. Thus it is evident that the Australian fauna must have at one time traversed a land connection with the East Indies. The typical Arctic fauna is an example of adaptation to special environmental conditions. Most naturalists agree in dividing the surface of the earth into six zoological regions:—

Palæarctic: Europe (including Iceland and other N. Atlantic islands), Africa n. of the Atlas Mts., N. Asia, Japan; **Ethiopian:** Africa s. of the Atlas, Madagascar, and surrounding islands; **Oriental:** S. China, Philippines, India, and East Indies to Bali; **Australasian:** Australasia, including New Guinea, Celebes, and Lombok; **Neartic:** America n. of Mexico, Greenland; **Neotropical:** Mexico, Central and South America, and West Indies. See ZOOLOGY, CELL, PALÆOZOOLOGY, EVOLUTION, REPRODUCTION.

J. A. Thomson, *Outlines of Zoology*, 5th ed., 1911; *Cambridge Natural History*; R. Lydekker, *Geographical Distribution of Mammals*; J. A. Thomson, *Heredity*.

Cult of Animals.—Animals have played an important part in many religions, though it is often very difficult to get at the ideas underlying their worship. Certain animals have been sacred in certain countries, e.g. cattle in Egypt and India, elephants in Siam. Many ancient deities seem originally to have been animal, e.g. Dagon, the fish-god among the Semites. One form of animal worship has been totemism (q.v.): the totem animal could only be killed on special occasions, and was then sometimes sacramentally eaten. Among primitive races gods, beasts, and men are not clearly distinguished, and this accounts for much that would otherwise be unintelligible.

Frazer, *The Golden Bough*; Tylor, *Primitive Culture*.

Cruelty to Animals.—Legislation on this subject has been largely due to the efforts of the Royal Society for the Prevention of Cruelty to Animals (1824), which resulted in the passing of a number of Acts for the protection of animals and birds, both domestic and wild, all offences rendering those concerned liable to prosecution and fines.

ANIME, brown oleo-resin from *Hymenaea*, the locust tree of S. America, used in varnish-making and perfumery.

ANIMIN, chemical product of bone-oil distillation.

ANIMISM, the doctrine of souls and other spiritual beings. Through the medium of dreams, phantoms, and other agencies, primitive man is driven to believe in spiritual existence—that is, to refuse to identify life with matter in all cases. Thus attributing vaguely his own life to a spirit within himself, he proceeds by analogy to trace the changes and movements of the external world as being due to similar causes. He has not learned to differentiate conscious and unconscious existence, he cannot define personality, but he looks on all nature—rivers, mountains, winds, storms, rocks, stones, plants, and animals—as being the abode of spirits. The drama of nature around him, its successions of repose and strife, lead him to think of these spiritual beings as capable of assuming various forms—mineral, vegetable, animal; his instinct for a unity in nature makes such a continuity of life, a transmigration of soul, appear a likely process; and this stage of thought, in which soul or spirit is attributed to all natural objects, is called *Animism*.

E. B. Tylor, *Primitive Culture* (3rd ed., 1891).

ANIMUCCIA, GIOVANNI (1495–1671), Ital. musical composer; wrote *Laudi*, etc.

ANIO, see **ANIENE**.

ANION, see **ELECTRICITY** (ELECTROLYSIS).

ANISE (*Pimpinella Anisum*), umbelliferous plant of S. Europe and Levant; fruits (aniseed) used for preparation of oil of anise, used medicinally (as stomachic), and for confectionery and liqueurs.

ANJANGAON (21° 10' N., 77° 20' E.), town, Ellichpur district, Berar, India.

ANJAR (23° 5' N., 70° 1' E.), town, Bombay, India. Pop. 18,000.

ANJEELA, Cingalese canoe-dwelling.

ANJER (8° 5' S., 105° 40' E.), town, W. coast, Java; fort.

ANJOU (47° 27' N., 0° 25' W.), former countship, France, now forms most of Maine-et-Loire and part of Mayenne, Sarthe, Indre-et-Loire; capital was Angers. In early times often ravaged by Normans; countship held by Fulk the Red in late IX. cent.; passed in 1060 to house of Gatinais, to which belonged Geoffrey IV. of A. (Plantagenet), who in 1128 m. Matilda, dau. of Henry I. of England; his s. became Henry II. of England, and A. remained an Eng. province until lost to France by King John, 1203; given in 1246 by Louis IX. to Charles, king of Naples and Sicily, coming by marriage to house of Valois; given by King John to s., Louis I. of Naples; belonged to kings of Naples till death of René, 1480; subsequently an appanage of Fr. crown.

ANKARSTRÖM, JOHN JACOB (1762–92), member of bodyguard of Swedish king, Gustavus III., whom he murdered, 1792.

ANKER (Dutch), liquid measure equal to $\frac{1}{2}$ aam, or approximately 10 wine gallons; used especially for spirits.

ANKERITE, $\text{Ca}(\text{MgFeMn})(\text{CO}_3)_2$, yellowish reddish rhombohedral mineral, belonging to dolomite series, occurring in iron ore deposits of Styria and elsewhere.

ANKLAM (53° 52' N., 13° 39' E.), town, Prussia. Pop. 15,600.

ANKLE, the joint between the leg and the foot. See **JOINTS**.

ANKLESWAR (21° 30' N., 73° E.), town, on Narbadá, Bombay, India; mills. Pop. 11,000.

ANKOBER, AKOBER (9° 40' N., 30° 40' E.), town, S. Abyssinia.

ANKOLE (0° 10' S., 31° E.), fertile district, Uganda, Brit. E. Africa; minerals.

ANKUS, Indian elephant-goat.

ANKYLOSIS, the diminution or total loss of the movements of a joint.

ANKYLOSTOMIASIS, a disease caused by a worm (*Ankylostoma duodenale*), $\frac{1}{4}$ – $\frac{1}{2}$ inch in length, which makes its habitat in the upper part of the human small intestine.

ANN, Scot. form; *Annat*, Eng. and Scot. form of *Annates*.

ANN ARBOR (42° 18' N., 83° 47' W.), town, Michigan, U.S.A.; seat of Michigan Univ. Pop. (1910) 14,817.

ANNA, Indian nickel coin, value 1d.

ANNA AMALIA (1739–1807), Duchess of Saxe-Weimar; patroness of Goethe and Schiller.

ANNA COMNENA (b. 1083), Gk. historian; dau. of Alexius I., Byzantine emperor, whose life she wrote.

ANNA IVANOVNA (1693–1740), Empress of Russia; niece and successor of Peter the Great (1730); allowed paramour, Biren, to tyrannise over empire.

ANNA LEOPOLDOVNA (1718–40), some time Regent of Russia, niece of Anna Ivanovna (*q.v.*).

ANNA PERENNA (classical myth.), a deity in whose honour the Romans instituted festivals. Being persecuted by Lavinia, wife of Aeneas, she fled to the river Numicus, and bade the inhabitants of the country call her *Anna Perenna*, because she would remain for ever under the waters.

ANNABERG (50° 35' N., 13° E.), town, Saxony. Pop. 16,800.

ANNABERGITE ($\text{Ni}_3(\text{AsO}_4)_2 + 8\text{H}_2\text{O}$), apple-green earthy mineral, sometimes crystallised, occurring as alteration product of nickel ores.

ANNABON (1° 30' S., 5° 30' E.), Span. island, Gulf of Guinea; area, $6\frac{1}{2}$ sq. miles. Pop. c. 3000.

ANNALS, chronological summary of events; term derived from *Annales Pontificum* or *Annales Maximii* of early Rome, compiled by Pontifex Maximus; annually recorded magistrates' names and noteworthy events; mediæval a's a development of 'Paschal' tables of early Western Church.

Compilers of a's on Roman history from Second Punic War to I. cent. B.C. were at times called **ANNALISTS**; among them were Fabius Pictor (II. cent. B.C.), Cincius Alimentus (both writing in Greek), and M. Porcius Cato (in Latin).

ANNAM, ANAM (11° to 21° N., 104° to 109° E.), Fr. protectorate, E. side of Indo-China, between Tonkin and Cochinchina; long narrow district; area, c. 52,100 sq. miles; surface mountainous except along coast, where are extensive rice-fields, giving employment to great majority of population, while sugar-cane is cultivated near Tourane. Besides rice and sugar-cane, principal products are maize and other cereals, cotton, tea, mulberries, rubber; minerals include coal, iron, gold, silver. Coast has several good harbours, notably Tourane Bay, Hon-Kohe, Nan-Khiot. Capital, Hué. Rainy season lasts from Sep. till Jan. Inhabitants are of Mongol race, professing Buddhist and Confucian religions. Pop. 5,600,000. Map, see **SIAM**.

ANNAN (54° 59' N., 3° 15' W.), burgh and port, Dumfriesshire. Pop. (1911) 4219.

ANNANDALE.—(1) (55° 10' N., 3° 25' W.) district of Dumfriesshire, Scotland. (2) W. suburb of Sydney, N.S.W.

ANNAPOLIS (38° 58' N., 76° 29' W.), capital, Maryland, named after Queen Anne; has Naval Academy, St. John's Coll., Observatory; principal industry, oyster-tinning. A. Convention met here, 1786, and summoned the Philadelphia Convention (*q.v.*) for the following year. Pop. (1910) 8609.

ANNAPOLIS (44° 45' N., 65° 34' W.), seaport, Nova Scotia.

ANNATES, or 'first-fruits'; first year's income of any benefice, formerly paid to Pope, in England and elsewhere, from XIII. cent.; in earlier times a tax paid to bp. who ordained; in England conferred on Crown 1534, in France abolished 1789.

ANNATTO, **ARNOTTO**, orange colouring matter prepared from the pulp surrounding the seeds of a tropical American tree (*Bixa orellana*), and used as a dye and for colouring cheese, butter, etc.

ANNE (1665–1714), Queen of Great Britain and Ireland; second dau. of James II. by Anne Hyde; m. Prince George of Denmark (1683); succ., 1702. Her accession marked a violent reflux of Tory feeling. A Tory ministry, headed by Godolphin, was established. Marlborough and his hectoring wife managed the Queen. Marlborough (now or. Captain-General and Duke), a brilliant general, continued war begun by William III. Marlborough-Godolphin ministry lasted till 1710 (Sunderland, a violent Whig, was introduced 1706), and was distinguished by victories of Blenheim, Ramillies, Oudenarde, Malplaquet, capture of Gibraltar; expulsion of French from Flanders and Germany; and Union with Scotland. Between 1708–10 the Tory ministry became a Whig one. Its attitude to war and Church made it unpopular. Harley (dismissed 1708), kept Queen's confidence through backdoor influence of Abigail Masham, who supplanted the termagant Duchess of Marlborough in Anne's favour. Impeachment of Sacheverell (1710) was followed by fall of Whigs and formation of Harley Cabinet. The Duchess had to resign her key of office, and Marlborough was disgraced (1711). Harley (now Lord Treasurer and Earl of Oxford) concluded Peace of Utrecht (1713). Only one of A.'s many children survived infancy, and he d. at the age of eleven. The succession question divided the Tory party. Oxford was dismissed (July 1714) and Bolingbroke became Prime Minister. His plans for a Jacobite Restoration, however, were defeated by Anne's death and intervention of Whig lords; Elector of Hanover suc. as George I. (q.v.). Anne's reign witnessed a great spiritual revival and much political and intellectual activity. Dull, obstinate, but homely and good-natured, A. was deeply religious and 'entirely English' at heart.

Paul, *Queen Anne* (1907).

ANNE OF AUSTRIA (1610–66), dau. of Philip III. of Spain, wife of Louis XIII., and mother of Louis XIV.; regent on death of husband, with Cardinal Mazarin for minister; triumphed over Fronde (q.v.); retired to convent on death of Mazarin.

ANNE OF BOHEMIA (1366–94), dau. of Charles IV. of Germany; queen of Richard II. of England.

ANNE BOLEYN, see **BOLEYN**.

ANNE OF BRITTANY (1477–1514), wife of Charles VIII. of France, and afterwards of Louis XII.; added Brittany to France.

ANNE OF CLEVES (1515–57), fourth wife of Henry VIII.; unprepossessing appearance; marriage (Jan. 1540), arranged from political motives by the unfortunate Cromwell, was dissolved in six months. A. retired with a pension; d. at Chelsea.

ANNE OF DENMARK (1574–1619), wife of James VI. of Scotland (I. of England); m. at Opslo (1589); Prince Henry born (1594, d. 1612); crowned with James after Elizabeth's death (1603). A. was extravagant and pleasure-loving, but was nevertheless a faithful wife and devoted mother.

ANNE, ST., ANNA, wife of St. Joachim and mother of Virgin Mary; patron saint of carpentry; festival, July 26.

ANNEALING, process of making a substance, especially glass, iron, or steel, homogeneous and less brittle by slow cooling from a high temperature. If cooled rapidly, e.g. in water or oil, many metals are hardened, but require tempering (to prevent subsequent cracking) by being subjected to a certain heating up, the requisite temperature in the case of steel being judged from experience or by its colour.

Case-hardening means giving the outer part of a wrought-iron or mild steel object a special hardness, as is necessary, e.g., in eyes of levers, link motions of engines, etc.

ANNÉCY (45° 54' N., 6° 9' E.), chief town, Haute-Savoie, France; on beautiful Lac d'A. Pop. 13,620.

ANNELIDA, segmented worms—earth-worm, lob-worm, and leech are representatives.

ANNEN (51° 37' N., 7° 25' E.), town, Westphalia, Prussia; coal and iron. Pop. 12,200.

ANNEXATION, the act of seizing anything; in international law, the act of adding foreign territory to a state, either by forcible seizure or by the voluntary cession of one state, or power, to another in the interests of peace, or from some other cause.

ANNICERIS, Gk. philosopher, disciple of Aristippus, who founded a sect at Cyrene, and ransomed Plato from captivity.

ANNING, MARY (1799–1874), Eng. palæontologist; discovered *Ichthyosaurus* and *Plesiosaurus*.

ANNISTON (33° 40' N., 85° 50' W.), town, Alabama, U.S.A. Pop. (1910) 12,994.

ANNITE, black type of lepidomelane (q.v.).

ANNIVIERS, VAL D' (46° 9' N., 6° 37' E.), valley, Valais, Switzerland.

ANNO, ST. (d. 1075), abp. of Cologne; virtual ruler of Germany during minority of Henry IV.

ANNONA (Lat. *annus*, year), in Roman myth. the personification of the year's produce of the earth.

ANNONAY (45° 14' N., 4° 40' E.), town, Ardèche, France. Pop. 17,500.

ANNUAL REGISTER, Eng. list of public events published yearly: started, 1759, by bookseller Robert Dodsley; now pub. by Messrs. Longmans; early association with Edmund Burke; *New A. R.* ran 1781–1825, *Edinburgh A. R.* (to which Scott contributed) 1808–27; French *Annuaire historique* (1818) gave place (1849) to *Annuaire des deux mondes*.

ANNUALS, books of which new edition or further member of series is published annually. These include desk-books containing useful information and literary a's which preceded present Christmas number issue of most periodicals. Old literary a's, now rare, started with *Forget-me-not* (1822–44); among treasures of this kind are *The Literary Souvenir* (1824–34), to which important literary men contributed; *The Keepsake* (1827–56), for which Scott wrote; and *The Book of Beauty* (1833–56), edited by the famous Countess of Blessington. Among numerous modern a's are Whitaker's *Almanack*; *The Statesman's Year-Book*; Hazell's *Annual*; *Who's Who*; *Who's Who in America*; Crookford's *Clerical Directory*.

In botany, plants which germinate, flower, fruit, and die in a year.

ANNUITY, an amount of money, payable annually or at shorter intervals, either for a period of years or during the continuance of a person's life. Unless the contrary is stated, the word 'annuity' is understood to mean a life a. The Brit. Government grants a's in exchange for stock, the residue from the expired a's being devoted to the reduction of the National Debt. Government a's are also obtainable through the Post Office, of amounts from £1 up to £100; see *Insurance as a Means of Investment*, by W. A. Robertson.

ANNULAR, adjective applied to solid formed by closed curve rotating round axis outside it (math's); ligaments at wrist or ankle (anat.); duct strengthened by thickened layers forming rings (bot.).

ANNULARIA, family of fossilised plants, possibly kind of Calamitea.

ANNULET (heraldry), ring, to distinguish 5th a. or bro.

ANNULOSA, term for higher worms and arthropods.

ANNUNCIATION, THE, announcement of Christ's Incarnation to the Virgin Mary; feast (*Lady Day*), March 25.—**Annunciation, The Supreme Order of the**, knighthood order of house of Savoy.

ANNUNZIO, GABRIELE D', see **D'ANNUNZIO**.

ANNUS DELIBERANDI (year for deliberation), term in Scots law for year in which heir might decide as to acceptance of inheritance; shortened to six months, 1858-60; now obsolete through fact that heir is not responsible for debts of ancestor.

ANNUS MIRABILIS (marvellous year), name given to 1666; poem of Dryden called *A. M.* describes victory over Dutch and Great Fire of London of that year.

ANNWEILER (49° 12' N., 7° 55' E.), village, Bavaria; S.E. are the ruins of Trifels Castle; tanning, paper-making. Pop. 4000.

ANOA (*Bos depressicornis*), dwarf buffalo of Celebes.

ANODE, see **ELECTRICITY** (**ELECTROLYSIS**).

ANODONTA, Pond-mussel, see **LAMELIBRANCHIA**.

ANODYNE, anything, commonly a drug, which relieves pain.

ANOMALURIDE, see **FLYING SQUIRREL**.

ANOMALY.—In a body revolving about a centre of attraction (like the earth round the sun) the nearest point to that centre is called the *pericentre* of the orbit. When the earth is at its pericentre it is said to be in *perihelion*, and in *aphelion* when farthest away. *A.* is the angular distance of a body from the pericentre of its orbit; and an *anomalous year* is the time taken by a planet to pass from any given *a.* to the same again. It is convenient to reckon it for the earth from one to the next passage of the pericentre, and as this moves slightly the anomalous year is 4 minutes 39.02 seconds greater than a sidereal year.

ANONYMITY, omission of name of author from his production (cf. *Pseudonymity*, use of false name). Many literary productions, like *Aucassin et Nicolette*, obstinately continue to conceal their authorship, but others yield to scholars' labours; progress of criticism in modern times has done much to discover secrets of styles and unmask *a.* Some treatments of this subject are Halkett and Laing, *Dictionary of the Anonymous and Pseudonymous Literature of Great Britain* (1881-88); Cushing, *Anonymous* (1890); Melzi, *Dizionario di opere anonime e pseudonime di scrittori italiani* (1848-59) with *Appendice* (1887); Quérard, *Supercheries littéraires dévoilées* (1869-71); Barbier, *Dictionnaire des ouvrages anonymes et pseudonymes* (1872-79); Brunet's *Supplément* (1889); *Deutsche Anonymenlexikon* (1902-3). Britain, America, and Germany largely employ *a.* in journalism, but France passed a law, 1850, by which all political and religious manifestations must be signed.

ANOR (49° 58' N., 4° 5' E.), town, France. Pop. (1901) 4610.

ANORTHITE ($\text{CaAl}_2\text{Si}_2\text{O}_8$), mineral occurring in basic igneous rocks, belonging to feldspar group; anorthic crystals.

ANOSMIA, see **SMELL**.

ANQUETIL-DUPERRON, ABRAHAM HYACINTHE (1731-1805), Fr. Orientalist; app. interpreter of Oriental languages at Paris Royal Library (1762); associate of Academy of Inscriptions (1763); was discoverer and first translator of the *Zend-Avesta* (1771).

ANSA, loop-like structure of nerves (anat.); apparent 'handles' to heavenly body formed by ring projecting on two sides (e.g. of Saturn).

ANSARS (Sp., from Arab. *anṣār*, helpers), inhabitants of Medina, so called from fact that they gave aid to Mahomet.

ANSBACH, ANSFACH (49° 19' N., 10° 34' E.), town, Bavaria; machinery, weaving. Pop. 18,500.

ANSCHARIUS, ST., ANSCHAIRE, ANSGAR (801-65), 'Apostle of the North'; thought to have been born in Picardy; preached Christianity in Scandinavia, 801-64.

ANSDALL, RICHARD (1815-85), Eng. artist; b. Liverpool; famous for his pictures of animals; A.R.A. 1861; R.A. 1870.

ANSEGIUS (d. 833), abp. of Sens; made first collection of Carolingian Capitularies, 827.

ANSELM OF LAON (XI. cent.), Fr. theologian; a famous teacher of the Middle Ages.

ANSELM, ST. (c. 1033-1109), prelate and theologian; b. Aosta; became a monk, prior of Bec, 1063, and abbot, 1078; renowned for learning and practical wisdom; came to England, 1092; app. abp. of Canterbury by William II., 1093; had long quarrel with King over his investiture, which A. declared should be at hands of the Pope; a compromise effected, but dispute continued under Henry I. till 1109, when King made formal surrender. A. is famous as a scholastic theologian; his greatest work, *Cur Deus Homo*, profoundly influenced theology of the Atonement.

Church, *St. Anselm*.

ANSELME, FATHER (1625-94), Fr. genealogist; Augustinian friar; his works on heraldry, etc., are historically valuable.

ANSON, GEORGE ANSON, BARON (1697-1762), Brit. admiral; commanded voyage of circumnavigation (1740-44), and helped to reform navy; cr. Baron A. of Soberton (1747); story of his *Voyage round the World* (1748) highly popular.

ANSON, SIR WILLIAM REYNELL, Bart. (1843-), Eng. scholar and lawyer; Warden of All Souls' Coll., Oxford; Vice-Chancellor of University (1898-99); M.P. for University (L.U.); author of *Principles of the English Law of Contract*, etc.

ANSONIA (41° 21' N., 73° 5' W.), town, Connecticut, U.S.A.; machinery. Pop. (1910) 15,152.

ANSTED, DAVID THOMAS (1814-80), Eng. geologist, consulting mining engineer, popular writer on geological subjects; F.R.S.

ANSTEY, CHRISTOPHER (1724-1805), Eng. poet; wealthy country gentleman; ed. Elton and Cambridge; famed for *New Bath Guide* (1766), a piece of humorous satire in verse, highly praised by Walpole and others (*Poetical Works*, 2 vols., 1808).

ANSTEY, F., pseudonym of THOMAS ANSTEY GUTHRIE (1856-), Eng. humorist; shows comic power of unusual kind in *Vice Versé* (1882), *The Brass Bottle* (both dramatised with great success), and other novels; *The Man from Blankley's*, a play, and contributions to *Punch*.

ANSTRUTHER (56° 14' N., 2° 42' W.), port, Fife-shire; includes Kilrenny, Easter and Wester A.; fisheries. Pop. (1911) 4252.

ANT (*Formicida*), family of hymenopterous insects resembling bees and wasps both in structure and in having highly evolved social habits which have excited the interest of observers from ancient times. The so-called *white ants* or termites (*q.v.*) belong to the entirely different order of Neuroptera. *A.*'s occur in three different forms, the queens or fertile females, smaller usually sterile females or workers, and the short-lived males.

The whitish eggs laid by the queen develop into legless grubs (larvæ), which are fed by the workers and become chrysalids or pupæ, sometimes enveloped in silken cocoons. The workers continue to care for the helpless young for some time. After fertilising the queens during their nuptial flight, the males usually die, while the economy of the community is carried on by the workers and queens, special care being devoted to the building of nests for storing food and rearing the young. The complexity of their social life is illustrated by the division of labour in the workers, who may be differentiated into 'soldiers,' 'nurses,' and other castes. Different species also exhibit a great variety of functions. Some (e.g. *Formica sanguinea*) are predaceous, and invade the nests of other species, carrying home worker pupæ who are reared to become slaves. Others, like *Anergates*, have degenerated into being entirely dependent on their slaves.



MALE ANT. *TH*, anterior part of thorax; *W*, waist, formed from anterior segments of the abdomen; *PA*, posterior abdomen.

Many species have developed agricultural habits, cultivating certain fungi on specially prepared beds of finely-cut leaves, and harvesting the seeds of grasses which they store in 'granaries.' A's of pastoral habits tend other insects, known as ant-guests, in their nests, and in return receive nutrient secretions from them, e.g. the honey-dew of Aphides (*q.v.*). Other guests seem to be kept as pets, emotions of joy and playfulness having been observed to be developed in some a. species. Some small species (*Solenopsis*) are thieves who steal the larvæ of other a's. Other peculiarities characterise the honey a's, whose workers forcibly inject honey into other workers with enormously distended abdomens, used as living honey-pots for the young brood. *Pseudomyrma* lives in the thorns of certain Central and S. American acacias, defending the trees against the destructive leaf-cutting a's (*Atta*). See HYMENOPTERA.

D. Sharp, *Cambridge Natural History*, vol. vi., 1898; Sir J. Lubbock, *Ants, Bees, and Wasps*, 1882; E. Wasmann, *Die psychischen Fähigkeiten der Ameisen*, Stuttgart, 1899; C. Ll. Morgan, *Animal Behaviour*, 1900.

ANTEUS (classical myth.), a Libyan giant, s. of Goa (the earth) and Poseidon (the sea). When his feet were planted on the earth he was invincible. Hercules, whom he challenged, divining the secret of his strength, lifted him in the air, and crushed him to death.

ANTALCIDAS, Spartan general, who made treaty with Persia, 387 B.C.

ANTANANARIVO (19° S., 47° 45' E.), chief town, Madagascar; built on hill; palaces, mosque; two cathedrals; rebuilt since 1869. Pop. (1911) 94,800.

ANTAR (fl. VI. cent.), Arab poet whose works are included in *Divans of the Six Ancient Arabic Poets* (1870), by Wilhelm Ahlwardt (*q.v.*).

ANTARCTIC (66° 30' S. to Pole), South Polar region. See POLAR REGIONS.

ANTARES, see SCORPIA.

ANT-EATER, name for mammals feeding on termites and ants. The great a. or ant-bear (*Myrmecophaga jubata*) lives in humid savannas of tropical America, destroys termite nests with strong claws, seizing prey with long sticky tongue. The tamandua and little a. are smaller, arboreal species. The aardvark of S. Africa and a few other mammals are also termed a's.

ANTE-CHAPEL, part of church on west side of chancel.

ANTEDILUVIAN, character of period before Flood; hence epithet for that which is extremely antiquated.

ANTELOPES, ruminants with non-deciduous, hollow horns, differing from goats by the lack of a beard and longitudinal ridges on the horns, and by living, on the whole, in the plains. About 150 species are included, but the group does not permit of a precise definition, the classification of the white goat of N. America and the chamois being doubtful. The size varies between the pigmy a. (*A. pygmaea*) of Africa (8 in. high) and the eland (*Taurotragus oryx*), which may stand up to 6 ft. in height and weigh about 1500 lb. Most a's are natives of Africa, e.g. the gazelles, the gru, wildebeest, hartebeest, blesbok, oryx, and the bucks. The nilgai, the four-horned Indian chousingha, and the saiga are the best known Asiatic representatives.

P. L. Sclater and O. Thomas, *The Book of Antelopes* (4 vols., London, 1894-1900).

ANTENOR (classical myth.), Trojan prince, famed for his wisdom, who advised the Trojans to restore Helen to Menelaus. A. afterwards migrated to Italy and founded the town of Padua.

ANTEQUERA (37° 3' N., 4° 29' W.), town, Malaga, Spain; grain, fruit. Pop. 31,600.

ANTHELION, halo observed in alpine and polar regions round shadow of object cast by sun on cloud or fog-bank opposite.

ANTHEM (A.S. *antefen*, antiphon), hymn or arrangement of Scripture sung as part music. See ANTIPHON.

ANTHEMIUS (VI. cent.), Gk. architect and mathematician; designed the mosque Hagia Sophia in Constantinople; his bro's attained eminence in med. philology and jurisprudence.

ANTHER, see FLOWER.

ANTHERIDIUM, male sexual organ in Bryophyta and Pteridophyta; analogue of anther.

ANTHEROZOID, male sexual cell of antheridium.

ANTHESTERIA, annual Athenian festival in honour of Dionysus; lasted three days (11th-13th) in month Anthesterion (Feb.-March).

ANTHOLOGY, title derived from a Gk. word, meaning a garland, or collection of flowers, and applied generally to a choice collection of poetry. The most famous collection of the kind is the Gk. Anthology. The earliest version was that compiled by Meleager of Gadara (60 B.C.), which included poems by himself and some forty earlier poets. Additions were made by later editors, the most complete and best selected collection being that compiled by Constantinus Cephalas, a X.-cent. grammarian. The MS. of this collection was discovered in the Heidelberg Library (1606), and was first pub. in Brunck's *Analekti Veturum Poetarum Græcorum* (1772-76), the later and standard edition being F. Jacob's *Anthologia Græca* (13 vols. 1794-1803; new ed. 1813-17). This work contains specimens from 300 writers, and represents the most exquisite work of the Gk. poets from the earliest times. There are Eng. trans. of selections by Sterling, Merrivale, Macgregor, and Richard (Garnett). Latin a's, in imitation of the Gk., were pub. by Scaliger (1573), Pitthöus (1590), Burmann (1759), and Riese (1869). Amongst Eng. a's the best-known are F. T. Palgrave's *Golden Treasury* (1st and 2nd Series); Sir A. T. Quiller-Couch's *Golden Pomp*, and *The Oxford Book of English Verse*; H. C. O'Neill's *Pure Gold*; Canon Beeching's *Lyra Sacra*, and *A Paradise of English Poetry*; Watson's *Lyric Lore*; Henley's *Lyra Heroica*; and Massfield's *A Sailor's Garland*.

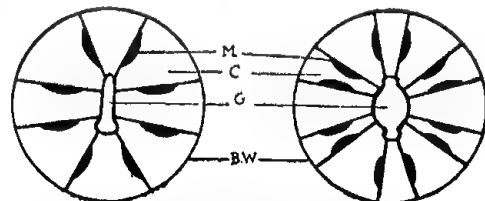
ANTHOMEDUSÆ, see under HYDROMEDUSÆ.

ANTHON, CHARLES (1797-1867), Amer. scholar; prof. of Gk. and Latin at Columbia.

ANTHONY, ST., ANTONY (251-356), founder of Monachism; b. Koma, Upper Egypt; said to have lived many years in lonely ruin of Thebaid, suffered strange temptations which have been favourite literary subject, and performed miracles related by Athanasius.

ANTHONY, SUSAN BROWNELL (1820-1906), Amer. reformer; Woman's Suffrage advocate.

ANTHOZOA, ACTINOZOA, class of Coelentera, represented by sea-anemones and coral-forming polyps, with tentacles often provided with stinging cells round the mouth, a well-developed gullet, and vertical radially arranged ridges or mesenteries on the interior of the body walls. They reproduce



CROSS-SECTION OF 1, ALCYONARIAN; 2, ZOANTHARIAN. M, muscle bands on mesenteries; C, coelenteron or gut-cavity of the body; G, gullet; BW, body-wall.

sexually, and chiefly by budding. Both individuals and colonies are some of the most beautiful denizens of the sea. The A. are divided into two subclasses. The *Zoantharia* have tentacles and mesenteries, some multiple of six, the limy skeleton, if any, grows from the base, and they are either simple or colonial,

and include the sea-anemones (Actiniaria), the reef-corals (Madreporaria), and the 'black' corals (Antipatharia). The *Aloyonaria* have eight feathered tentacles and eight mesenteries, and diversely shaped calcareous spicules forming corals, e.g. Dead-Men's-Fingers (Aloyonium), Sea-Pen (Pennatula), Red coral (Corallium), Organ-Pipe coral (Tubipora), etc. See COLENTERRA, CORAL.

Challenger Reports, Zoology, vi. (1882), xvi. (1886), xxxi. (1889), xxxii. (1899).

ANTHRACENE ($C_{14}H_{10}$), white, fluorescent, crystalline solid; M.P. 213° , B.P. 361° ; obtained from coal tar, used in preparation of alizarin and other dyes.

ANTHRACITE, hard kind of coal (stone-coal) in which vegetable constituents have been mineralised further than in ordinary coal; mined chiefly in N. America, China, Westphalia, and S. Wales; used as a smokeless, non-luminous fuel and for production of 'Dowson gas' for power purposes.

ANTHRACOTHERIUM, 'coal animal,' genus of extinct ungulate mammals, related to hippopotamus, found in lignite of Oligocene and Miocene of N. hemisphere, chiefly in Europe.

ANTHRAQUINONE ($C_{14}H_8O_2$), yellow crystallised organic substance, M.P. 277° ; obtained from anthracene, used in manufacture of *Alizarin* (q.v.).

ANTHRAX, a virulent infectious disease, occurring more usually in cattle, sheep, horses, and other herbivores, but communicable by them to man. It affects animals in all parts of the world and particularly in marshy districts, usually through contaminated fodder or water, or by the infection of a surface wound. An attack is often very sudden, an animal falling down in convulsions, or there may be at first fever and bleeding at the mouth, etc. The public health authorities have very stringent regulations regarding the disposal of the bodies of infected animals.

The men usually infected are such people as wool-sorters, farm hands, and groomers, and the disease may be either external or internal. In the former a vesicle forms on the surface, which becomes pustular, and the danger is that the disease may become generalised. To prevent this, the affected area should be completely excised, and pure carbolic acid applied to the surface. In the internal form, in which infection usually causes virulent pneumonia, the anti-anthrax serum which has been introduced should be tried, and the person's strength kept up, but recovery is rather rare.

ANTHROPOID APES (*Simiida*), zoological family including the gibbon, gorilla, orang, and chimpanzee, resembling man in many ways.

ANTHROPOLOGY, the science of man, is, necessarily, of an extremely complex nature and difficult to define. It comprises the comparative anatomy of human races (physical a.), the study of their functions (ethnology), and their history, while anthropogeography treats of their distribution. The earliest history of man (archæology) merges into palæontology on one side and folk-lore and modern history on the other. The comparative study of the functions (physiology and psychology) of human races includes that of speech (philology), of craft (technology), of art (aesthetics), of conduct (ethics), and of religion (theology). The study of social customs (sociology) links folk-lore, economics, and politics. A. in the popular sense, i.e. physical a., has for its aim the elucidation of the relationship between the races of mankind and their forebears, and to define the term 'race' itself. Its methods are observational or statistical. The former deals with characters such as stature and pigmentation, and includes the study of the relative shapes of skulls (craniometry, q.v.). Concerning this branch of a. an interesting problem has been raised by the observation that there is a tendency of the skulls of immigrants to become in the course of a few generations like the native skull

type, the example being the approximation of the skulls of Anglo-Saxon, Scandinavian, Italian, and other racial representatives to the Indian type in N. America. The statistical method of treating anthropological problems is included in biometrics and mainly consists of collecting an adequate number of measurements of certain individual characters, e.g. stature, cephalic index, fertility, to be able to arrive at a general formula for the occurrence of the character of a population. See ANTHROPOMETRY, ETHNOLOGY, SOCIOLOGY, RACES OF MANKIND.

A. C. Haddon, *The Study of Man* (1897); J. Deniker, *The Races of Man* (1900); E. Haeckel, *Evolution of Man* (1879); Keith, *Ancient Types of Man* (1911).

ANTHROPOMETRY, the system of measuring certain parts of the human body for comparison or identification; Bertillon method of a. used in France for identifying criminals.

ANTHROPOMORPHISM.—(1) The attribution to the deity of human characteristics, feelings, and conduct, arising from the need of symbolising the abstract. In Gk., Assyrian, Babylonian, Egyptian, and Judaic worship a. is met with, and persists in the Christian Churches and Muhammadanism. (2) Attribution of human characters to inanimate objects.

ANTHROPOPHAGY, cannibals. See CANNIBALISM.

ANTI, ferocious tribe of S. Amer. Indians (S. Peru).

ANTIAR, tree found in Java; upas tree.

ANTIBES ($43^{\circ} 34' N.$, $7^{\circ} 8' E.$), Mediterranean port, France. Pop. 10,500.

ANTI-BURGHES, name given to former Soot, religious body, the General Association Synod, formed 1747 by those who rejected Presbyterian (q.v.) burghers oath.

ANTICHRIST.—The conception of 'Antichrist' is that of a great enemy of God who will rise to power at the end of time. For the origin of this idea we must go back to the mythology of ancient Babylon and Iran. Iranian religion was dualistic, i.e. there was always a conflict between the power of good and the power of evil. This became involved with the Babylonian myth of the struggle of the Supreme God with a primeval water-dragon. These conceptions, like other myths, came to be applied to historic persons, so Antiochus Epiphanes in the Book of *Daniel* (II. cent. B.C.) becomes the type of an enemy of God, called in Christian theol., whence the term is taken over, 'Antichrist' (see in New Testament, *1 John*; of the 'man of sin,' *2 Thessalonians* 2³; and the reappearance of the dragon myth in *Revelation* 12). A. has been identified with Nero, Simon Magus, by Protestants with the Pope, and by Catholics with heresiarchs. It gave birth to a considerable Christian lit.

Bousset, *Antichrist* (1895).

ANTICLIMAX, term of rhetoric for weak culmination of literary crescendo (see CLIMAX). Well-known example, Pope's

'And thou Dalhousie, the great God of War,
Lieutenant-Colonel to the Earl of Mar,'

shows literary effect of intentional use.

ANTICOSTI ($49^{\circ} 27' N.$, $63^{\circ} 5' W.$), island, Quebec, Canada. Pop. 260; now a game-preserve owned by M. Menier, the chocolate maker.

ANTICYCLONE, an atmospheric pressure system in which the pressure diminishes from the centre. In N. hemisphere air moves, in a. system, clockwise spirally outwards, in S. hemisphere counter-clockwise.

ANTICYRA.—(1) ($38^{\circ} 22' N.$, $22^{\circ} 38' E.$) Ancient town, Phocis, Greece; famous for its hellebore. (2) Others in Thessaly and Locris.

ANTIETAM ($39^{\circ} 40' N.$, $77^{\circ} 38' W.$), river, Maryland; joins Potomac near Sharpsburg, where Federalists under McClellan defeated Confederates under Lee, 1862.

ANTI-FEDERALISTS, opponents of the U.S. Federal Constitution (1787).

ANTIGO (45° 8' N., 89° 7' W.), town, Wisconsin, U.S.A.; lumber, furniture. Pop. (1910) 7196.

ANTIGONE (classical myth.), dau. of Oedipus and Jocasta; a devoted dau., she guided her blind f. in his wanderings; tragedy by Sophocles.

ANTIGONISH (45° 38' N., 62° W.), town, Nova Scotia.

ANTIGONUS CYCLOPS (382-301 B.C.), Macedonian king; general of Alexander the Great; defeated and slain at Ipsus (301) by coalition of fellow-satraps.

ANTIGONUS GONATAS (d. 239 B.C.), king of Macedon; patron of arts.

ANTIGONUS OF CARYSTUS (fl. III. cent. B.C.), Gk. historian; author of *Lives of the Philosophers*, and other works.

ANTIGUA (17° 12' N., 61° 53' W.), one of Leeward Islands, Brit. W. Indies, discovered by Columbus, 1493; chief product, sugar; capital, St. John. Area, 108 sq. miles. Pop. (1911) 32,265.

ANTI-JACOBIN, newspaper run, 1797-98, by George Canning (q.v.) to combat views of Fr. Revolutionary party called Jacobins (q.v.).

ANTILEGOMENA, term used in Early Church for Scriptures of doubtful authenticity.

ANTILLA, mythical isle, Atlantic.

ANTILLES (14° N., 60° W.), W. Indies (q.v.); Northern Islands form Greater A., the Eastern (Leeward and Windward) the Lesser A.

ANTIOCHUS (classical myth.), s. of Nestor, friend of Achilles; hero of Trojan War.

ANTIMACHUS (fl. 400 B.C.), Gk. poet and grammarian; held in estimation by Plato; founded a school of epic poetry; ranked by some critics next to Homer.

ANTIMONY (Sb=120-2), bluish white, lustrous, brittle, crystalline, metallic element; M.P. c. 430°, B.P. c. 1300°. It occurs in the pure state in Borneo, Sweden, and Dauphiné, but chiefly in China, as stibnite (Sb₂S₃), from which it is smelted. A. having the property of expanding when solidifying and imparting this characteristic to its alloys, it is used extensively for sharp castings, especially type-metal, which consists of a., lead, and tin. An alloy of a., tin, and a small quantity of copper or zinc is called *Britannia metal*. A. acts as a severe poison similar to arsenic. Its compounds, especially tartar emetic (a. tartrate), are occasionally used medicinally to encourage perspiration and as a nervous depressant.

ANTINOMIANS (Gk. 'against law'), those who laid emphasis on faith, rather than on the moral law; especially so called by Luther.

ANTINOUS (d. 130 A.D.), Bithynian youth of great beauty, deified by Emperor Hadrian.

ANTIOCH (36° 10' N., 36° 10' E.), ancient town, on Orontes, Syria; named after Antiochus, whose s. Seleucus Nicator founded it in 300 B.C.; capital of Seleucid empire from c. 240 B.C.; citadel, fine public buildings; noted for wealth, luxury, and laxity of morals; reputation for art and lit.; great trading centre; taken by Romans, 64 B.C.; visited by Paul and Barnabas; was early centre of Gentile Christianity and missionary effort; suffered frequently from earthquakes; sacked by Chosroes of Persia, 538; rebuilt by Justinian; taken in turn by Saracens, Greeks, Turks, Crusaders, Egyptians; came into possession of Turks, 1516; modern town, Antakia. Pop. c. 26,000.

ANTIOCH IN PISIDIA (c. 38° 10' N., 31° 5' E.), ancient town, Asia Minor.

ANTIOCHIAN, relating to Antiochus of Ascalon, eclectic philosopher.

ANTIOCHUS III., 'THE GREAT' (223-187 B.C.), king of Syria; conquered Palestine and Coele-Syria (198); later became involved in war with Romans, and was defeated by them at Thermopyla (191) and at Magnesia (190); compelled to yield possessions and pay heavy tribute, he was by the people for his extortion.

ANTIOCHUS IV., 'EPIPHANES' (175-164 B.C.), king of Syria; s. of A. the Great; conquered large part of Egypt; twice took Jerusalem; notorious for his oppression of Jews; endeavoured to suppress their religion, and introduce worship of idols, which led to their successful rising under Mattathias and the Maccabees.

ANTIOPE (Gk. myth.).—(1) Dau. of Asopus or Nykteus; by Zeus became mother of twins, Amphion and Zethus; sent mad by Dionysus on account of vengeance she took on Lycus and Dirce; cured and wedded by Phocus. (2) Sister of Amazonian queen Hippolyta, and mother of Hippolytus.

ANTIOQUIA (6° 35' N., 76° 5' W.), department, Colombia; gold, silver, platinum. Area, 11,517 sq. miles. Pop. 740,937.

ANTIPAROS (37° 8' N., 25° 2' E.), Gk. island, Aegean. Pop. variously estimated at from 700 to 2000.

ANTIPATER (d. 319 B.C.), Macedonian leader, under Alexander the Great.

ANTIPHANES (fl. 390 B.C.), celebrated writer of Attic comedy; fragments of his numerous plays are to be found in Athenaeus.

ANTIPHILUS (fl. IV. cent. B.C.), Gk. painter, contemporary of Apelles; portrayed Philip of Macedon, Alexander the Great, etc.

ANTIPHON, a composition for singing alternately, verse to be sung before or after the Psalms in liturgical services of R.C. Church.

ANTIPHON (b. 480 B.C.), celebrated Attic orator, who supported the oligarchical party at Athens, but, being accused of treason by the democrats, was condemned to death.

ANTIPODES (literally, with the feet opposite), those who live on the opposite side of the globe, and also the country of their habitation.

ANTIPODES ISLANDS (49° 30' S., 178° 30' E.), islands, New Zealand. Uninhabited.

ANTIPOPE, prelates who were not canonically elected popes, but, in spite of the fact that there existed a lawfully elected pope, claimed and to some extent received papal privileges. Hergenröther gives the names of twenty-nine a.s., but he omits the names of Benedict XIII. and John XXIII. Corrected in this way, his list reads: Hippolytus, III. cent.; Novatian, 251; Felix II., 355-65; Ursicinus, 366-67; Eulalius, 418-19; Laurentius, 498-501; Constantine II., 67; Philip, VIII. cent.; Anastasius, 855; Leo VIII., 56-63; Boniface VII., 974; John XVI., X. cent.; Gregory, 1012; Sylvester III., 1044; Benedict X., 1058; Honorius II., 1061-72; Clement III., 1080-1100; Theodoric, 1100; Aleric, 1102; Maginulf, 1105; Gregory VIII., 1118; Anacletus II., 1130-38; Victor IV., 159-64; Pascal III., 1164-68; Calixtus III., 1168-77; Innocent III., 1178-80; Nicholas V., 1328-30; Clement VII., 1378-94; Benedict XIII., 1394-1423; John, 410-17; Felix V., 1439-49.

Some of these names are probably of only equal trustworthiness with those of Diocorus, 530; Sergius, 890; and Christopherus, 903; which are given by other authorities.

ANTIPYRINE, PHENAZONE (C₁₁H₁₂N₂O), a white, crystalline, bitter, inodorous substance used in medicine for lowering the temperature in fever, and for relieving pain, e.g. of headache; other drugs are now more commonly used, because of its depressant action on heart. See PYRAZOLE.

ANTIQUARY, a person devoted to the study of archaeology and its kindred subjects. The Eng. Society of Antiquaries was formally constituted in 1717; the Scot. Society of Antiquaries in 1780; the Irish Society in 1890, though under other names it flourished much earlier; the Amer. Society (at Worcester, Mass.) in 1812.

ANTISANA (0° 40' S., 77° 18' W.), volcano, Ecuador, S. America.

ANTI-SEMITISM, the name given to a widespread political movement, which was directed against the Jews during the last twenty years of the XIX. cent.

and earlier years of the XX. cent. The hostile movement began in Germany and Austria, in both of which countries the Hebrew element was strong. The Jews, moreover, had succeeded in assimilating the German national spirit in a very remarkable degree, and, besides having secured the control of a large share of the State's commerce, individual members of the Jewish body had achieved high positions in lit., music, and other arts (e.g. Heinrich Heine, Karl Marx, Ludwig Börne, and Ferdinand Lassalle; the composers Mendelssohn and Meyerbeer; and the politicians Edward Lasker and Ludwig Bamberger). So powerful had the Semitic influence become in political life that Prince Bismarck found it a serious menace to his schemes, and there gradually arose a strong anti-Semitic feeling, which is said to have been engineered by the Prince himself, and was fomented by a court preacher named Adolf Stöcker. The spark was lit in the year 1879, and was quickly fanned into flame. Quarrels were fixed upon members of the Jewish race; they were insulted and boycotted; attempts were made to exclude them from the schools and univ's; duels between anti-Semites and Jews were of frequent occurrence; and street riots were by no means uncommon. This abominable persecution, however, did not meet with general acceptance, and, amongst others, the Crown Prince Frederick publicly denounced the agitation as a standing disgrace to Germany.

Scarcely had the excitement aroused by this outbreak subsided, when a much more serious one took place in Russia. This was in 1881. As in Germany, an antagonistic feeling against the Jews was stirred by secret means, and the reign of persecution began. The Russ. Jews were cooped up in huge ghettos, chiefly in the Polish areas, and when the work of massacre and burning commenced, it quickly spread throughout Western Russia. It is estimated that nearly 200 towns and villages were concerned in the outbreak, including Warsaw, Odessa, and Kiev; immense numbers of men, women, and children met with violent deaths, and many thousands of unoffending people were ruined. Though in England public indignation was raised to the highest pitch, little notice was taken of any protest, and similar outbreaks (*pogroms*) occurred in 1890-91, and also within recent times. Almost concurrently with these earlier outbreaks in Germany and Russia, there arose violent persecutions in Rumania and Austria-Hungary, while Fr. anti-Semitic feeling reached its climax in the conspiracy by means of which a Fr. Jewish officer, Captain Alfred Dreyfus, was, in 1894, convicted of treason. Through the efforts of Émile Zola and others, this officer was in course of time set at liberty, and proved to have been the victim of an abominable plot, yet the never-ending efforts to prevent justice being done to this man, and the real culprits exposed, are sufficient proof of how deadly was the Fr. prejudice against the Jews.

Efforts to create anti-Semitic feeling have from time to time been made in England and America, but with little success. Yet with a Jewish population in the world of between eleven and twelve millions, of whom about nine millions are in Europe, it is scarcely to be supposed that the day of persecution is over, or that the Jewish question is finally settled. An effort was made by Baron Hirsch, in 1891, to ameliorate the condition of the Jews by the foundation of the Jewish Colonisation Association, with a view to establishing settlements in Argentina, Brazil, and other places, and to this purpose he contributed the greater part of his wealth.

Leroy-Beaulieu's *Israel among the Nations*, 1895; Reinach's *Histoire de l'affaire Dreyfus* (Paris, 1898, 6 vols.); F. C. Conybeare's *Dreyfus Case*, 1898.

ANTISEPTICS, substances which destroy or prevent or arrest the growth of bacteria, thus preventing putrefaction or fermentation; introduced in surgery by Lord Lister (*q.v.*); sepsis of wounds was prevented, and the high mortality due to this cause reduced. See *SURGERY*.

ANTISPAST, term used in prosody for foot consisting of iambus and trochee (— — —).

ANTISTHENEES (fl. 365 B.C.), Gk. philosopher; was a pupil of Socrates, and a zealous follower of his teaching; founded the Cynic school of philosophy.

ANTISTROPHE, portion of a Gk. ode sung by chorus in the nature of a reply, or complement, to the *Strophe*.

ANTITHESIS, term of rhetoric for contrast; example: 'He had a head which statues loved to copy, and a foot the deformity of which the beggars in the street mimicked' (Macaulay, *Essays*).

ANTITOXINS, see *BACTERIOLOGY*.

ANTITYPE, person in whom a prophetic type is fulfilled; thus Christ is said to be s. of Isaac, the Brazen Serpent, Paschal Lamb, etc.

ANTIUM (41° 27' N., 12° 37' E.), old Volscian town, Italy; Rom. remains; modern Porto d'Anzio.

ANTIVARI (42° 5' N., 19° 9' E.), port, Montenegro. Pop. c. 2500.

ANT-LION (*Myrmoleon*), neuropterous insect of Continental Europe. Larva traps ants and other insects in conical pit excavated 2 in. deep in loose sand.

ANTOFAGASTA.—(1) (23° 38' S., 70° 24' W.) capital of (2). Pop. 32,500. (2) province, Chile. Area, 46,597 sq. miles. Pop. (1910) 118,718.

ANTOINE, ANDRÉ (b. 1858), Fr. actor-manager; founded *Théâtre Libre*, Paris, opened 1887, closed 1894, and *Théâtre A.*, 1897, for production of higher drama; director of *Odéon*, 1906.

ANTOMARCHI, FRANCESCO (1780-1838), Ital. physician; entered service of Napoleon at St. Helena 1818, and after his death published famous, but untrustworthy, *Derniers Moments de Napoléon* (1823); genuineness of his representation of cast of Napoleon's head much questioned.

ANTONELLE, MARQUIS D' (1747-1817), Fr. politician of time of Revolution; took prominent part in proceedings against Marie Antoinette.

ANTONELLI, GIACOMO (1806-76), Ital. cardinal (cr. 1847); had considerable influence over Pius IX. on anti-liberal and anti-national side; thought by some unscrupulous in finance and diplomacy.

ANTONELLO DA MESSINA (d. 1479), Ital. artist; was impressed with the style of Jan Van Eyck and the Flemish school of painters, and studied in the Netherlands; his own work, consisting largely of studies of Madonnas and Saints, shows strong traces of this influence; the National Gallery contains three canvases by him.

ANTONGIL BAY (15° 45' S., 49° 50' E.), bay, E. coast of Madagascar.

ANTONINUS, ITINERARY OF, an official record of roads and stations under the Rom. Empire, which is regarded as of considerable hist. value. The part referring to Britain (*Iter Britanniarum*) was edit. by T. Reynolds (1799).

ANTONINUS LIBERALIS (fl. 150 A.D.), Gk. writer of mythological stories.

ANTONINUS PIUS (86-161 A.D.), Rom. emperor; b. near Lanuvium; adopted s. of Hadrian, whom he suc. (138); comparatively peaceful reign; simple and just ruler; adopted Marcus Aurelius (*q.v.*).—Wall of Antoninus, Roman wall, built by Emperor Antoninus Pius, and stretching from the Firth of Forth to the F. of Clyde, in Scotland, distance about 40 miles. It was erected in the year 140 A.D., as protection against invasion from north.

ANTONINUS, ST. (1389-1459), Dominican abp. of Florence; distinguished himself by self-sacrifice and devotion during a visitation of the plague, followed by earthquake; canonised, 1523; his festival is May 13.

ANTONIO (1531-95), unsuccessful claimant to Portug. throne; prior of Crato; illegitimate s. of Luis, Duke of Beja, s. of King Emanuel. He was defeated 1580 and 1582, and subsequently found refuge in France and England.

ANTONIO, NICOLAS (1617-84), Span. bibliographer; author of *Bibliotheca Hispana Vetus*, and *Bibliotheca Hispana Nova*.

ANTONIUS, MARCUS (143-87 B.C.), a distinguished orator and prominent citizen; was one of the many eminent citizens of ancient Rome of the gens Antonia, named A.

ANTONIUS, MARCUS, MARK ANTONY (c. 83-30 B.C.), grandson of the above, was second only in influence and power during Caesar's dictatorship, and triumvir after his death, taking eastern half of Empire. His infatuation for Cleopatra ultimately caused senate to deprive him of his powers (32). He was defeated at *Actium* (31) and committed suicide (30 B.C.).

ANTONOMASIA, description used in place of personal name as 'bard of Rydal Mount' for Wordsworth, or the 'Prior of Crato' for Antonio.

ANTONY, ST., of Egypt, see **ANTHONY**.

ANTONY, ST., of Padua (1195-1231); was Canon Regular of St. Augustine 1210-21, when he entered Franciscan Order; became great preacher, and is reputed a famous worker of miracles, whence he was canonized a year after his death.

Lopitre, St. Antoine de Padoue, Eng. trans. by Guest (Lond. 1902).

ANTOZONE, hydrogen dioxide, H_2O_2 ; reduces ozone to oxygen.

ANTRAIGUES, EMMANUEL HENRI, COMTE D' (d. 1812), Fr. secret agent; murdered.

ANTRIM (54° 50' N., 6° 10' W.), county, N.E. Ireland; land area, 711,275 acres; capital, ANTRIM, largest town, Belfast; has Lough Neagh in S.; Giant's Causeway on N. Atlantic coast, remarkable basaltic cliffs; much of surface covered with volcanic rocks; bogs in S.W., hilly in N. and E. Chief rivers, Bann, Lagan. Produces flax, cereals; minerals include iron, rock salt, alum, clay. Industries include linen and cotton manufactures, fisheries, paper-making, distilling. Climate temperate. Pop. (1911) 478,603. Town, 1800.

ANTRIM, RANDAL MAC SORLEY MAC-DONNELL, 1ST EARL OF (c. 1580-1636), s. of Sorley Boy MacDonnell; implicated in O'Neill rebellion (1600).

ANTRIM, RANDAL MACDONNELL, 1ST MARQUESS OF (1609-83), Royalist; joined Ormonde; fought for king; cr. Marquess (1644); subsequently joined Ireton; excluded from Act of Oblivion at Restoration; his estates restored (1665).

ANTRUSTIONS, privileged guardian escorts of Merovingian sovereigns, almost always of Frankish descent; the institution disappeared about VIII. cent.

AN-TUNG (40° N., 124° 30' E.), port, Manchuria, China. Pop. c. 143,000.

ANTWERP.—(1) (51° 14' N., 4° 24' E.) town, Belgium, on Scheldt, great port and commercial city; has excellent harbour and extensive quays; ten dry docks; chief industries, shipbuilding, sugar, textiles, lace, petroleum, tobacco, distilling, diamond-cutting; exports glass, coal, chemicals, iron, steel, cotton, etc.; birthplace of Rubens (q.v.); has fine Gothic cathedral (with Rubens' *Descent from the Cross*), museums, etc.; strongly fortified. After Treaty of Westphalia, 1648, closing of Scheldt ruined trade of A., but since its reopening in 1863 town has regained commercial importance; at different times besieged, plundered, and taken by various powers. Pop. (1910) 320,600. (2) (51° 13' N., 4° 50' E.) province, Belgium. Area, 1093 sq. miles. Pop. (1910) 989,300.

ANU ('Great One'), Babylonian deity, the father of the gods.

ANUBIS, Egyptian deity (with jackal's head), who conducts dead to nether world.

ANURADHAPURA (8° 18' N., 80° 23' E.), ruined city, Ceylon; capital of the island, V. cent. B.C. Pop. 3672.

ANVILLE, JEAN BAPTISTE BOURGIGNON D' (1697-1782), Fr. geographer; achieved much success with a map of Italy (1743), in which he

corrected many errors of his predecessors; produced numerous geographical treatises, and upwards of 200 maps.

ANWARI, AUHAD UDDIN (fl. end of XII. cent.), Persian poet, whose shorter lyrics are highly estimated by Persian scholars.

ANYTUS, Athenian who with Meletas and Lycon accused Socrates of impiety, 399 B.C.

ANZENGRUBER, LUDWIG (1839-89), Austrian dramatist; wrote numerous plays chiefly dealing with peasant life, including *Der Weineidbauer*, *Hand und Herz*, *Das vierte Gebot*, etc.

ANZIN (50° 23' N., 3° 27' E.), town, Nord, France; coal-mining centre. Pop. 14,500.

AOKI, SHUZO, VISCOUNT (b. 1844), Jap. statesman; ambassador to Berlin, 1874 and 1892; minister, 1889-91, 1898-1900; took important part in revision of treaties with foreign countries.

AOMORI (40° 53' N., 140° 46' E.), town, Japan. Pop. (1908) 47,206.

AONIA, ancient district, Boeotia, Greece, sacred to the Muses; in its precincts was Mount Helicon, with the fountain of Aganippe, Milton's 'Aonian fount,' at its base.

AOSTA (45° 44' N., 7° 20' E.), town, Italy; Roman remains. Pop. 7600.

APACHES, North American tribe, definitely subdued, 1880; name also applied to bands of desperadoes who haunt streets of Paris at night.

APALACHEE, tribe of N. Amer. Indians; almost extinct.

APALACHICOLA (29° 44' N., 85° W.), town, Florida. Pop. (1910) 3065.

APARRI (18° 28' N., 121° 38' E.), port, Luzon, Philippines; tobacco. Pop. 18,300.

APATIN (45° 41' N., 18° 56' E.), town, Hungary. Pop. 14,000.

APATITE ((CaF/Ca₂P₂O₇) fluor-a.; (CaCl/Ca₂P₂O₇) chlor-a.), mineral phosphate of varying composition occurring in crystalline rocks, often in hexagonal crystals in Canada and Norway; provides phosphates necessary for plant life.

APE, synonym for monkey (q.v.), especially of 'family Simiidae.

APELDOORN (52° 13' N., 5° 48' E.), town, Holland. Pop. (1910) 36,500.

APELLA, Spartan general assembly at which State affairs were voted upon.

APELLES, court painter to Philip of Macedon and Alexander, and generally reputed to have been the greatest painter of ancient times; none of his works are now in existence.

APELICON (fl. 85 B.C.), famous Athenian book-collector.

APENNINES (38° to 44° N., 8° to 16° E.), mountain chain beginning in Maritime Alps and extending southward through Italy, and into Sicily; average height about 4000 ft., sinking in the N. to 3500 ft., and rising in centre to about 7000 ft.; highest point, Monte Corno, Gran Sasso d'Italia, (9578 ft.), in central portion of system; highest points in N. are Monte Bue, Monte Cimone; in S., Monte Miletto. Range is crossed by several railways at heights of from 1600 to 2000 ft. A. lie below snow-line. Rivers rising in A. are Po, Arno, Tiber, etc. Marble is found at Carrara, Seravezza, Siena.

APENRADE (55° 3' N., 9° 23' E.), town, Prussia. Pop. 7000.

APETALE, petal-less dicotyledons (q.v.). Some flowers have neither petals (*corolla*) nor sepals (*calx*), the outermost leaves. These are called *Achlamydeae*.

APHANITE, a term for fine-grained crystalline rock; formerly applied to a dark diorite.

APHASIA, loss of the powers of expression and understanding of ideas in speech and writing, resulting from brain lesions. There are several varieties of a., depending on the situation of the lesion and the brain centre thus affected. These may be divided into two groups: 1. motor a., including (a) loss of the

power of speech (*aphemia*), (b) loss of the power of writing (*agrophia*); 2. sensory a., including (a) loss of the power of understanding spoken words (*auditory a.*), (b) loss of the power of reading (*visual a.*).

APHELION, point of planet's or comet's orbit most distant from sun. See **ANOMALY**.

APHEMIA, see **APHASIA**.

APHIDES, plant-lice, small homopterous insects of order Hemiptera, destructive to plants; complex life-history; some species are domesticated by ants on account of 'honey-dew' in excretions. American blight and the vine-destroying *Phylloxera vastatrix* are well-known pests.

APHORISM, short, pithy sentence; term first used by the celebrated Gk. physician Hippocrates (d. 361 B.C.), whose first *aphorism* runs: 'Life is short, art is long.'

APHERATES (IV. cent. A.D.), Syrian convert from heathenism, who wrote upwards of twenty Christian homilies.

APHERODITE (classical myth.), Gk. goddess of love and beauty; dau. of Zeus and Dione; according to one legend A. sprang from the sea-foam (Gk. *aphros*, foam); as wife of Hephaestus (Vulcan) she proved as incontinent as she was beautiful; mother of Eros (Cupid) and the Trojan hero, Aeneas; passionately devoted to Adonis, a beautiful youth, slain by a boar whilst hunting. The swan, dove, swallow, and sparrow were sacred to her; also the rose, myrtle, and apple. In Rom. mythology she bears the name of Venus, and she is also the counterpart of the Phœnician Ashtoreth (Astarté).

APHTHEITALITE, white crystalline mineral composed of sodium and potassium sulphate.

APHYLLOUS, leafless, e.g. of plants.

API ISLAND (16° 45' S., 188° 15' E.), island, New Hebrides.

APIA (13° 50' S., 171° 44' W.), port, Upolu, Samoan Islands. Pop. c. 4000.

APIA, CHARLOTTE (1° 50' N., 173° 5' E.), island, Gilbert Islands, Oceania.

APIANUS, PETER, BIENIEWITZ (1501-52), Ger. astronomer. His *Cosmographicus liber* (1524) introduced improvements in science of geography, and *Astronomicum Casareum* (1540) contained discoveries as to comets. His son PHILIP (1531-89) pub. maps of Bavaria.

APICIUS, GAVIUS, notorious Roman epicure, who lived during the reign of Tiberius, and wrote some works on cookery.

APICULTURE (Lat. *apis*, a bee), the business of tending an apiary; bee-keeping.

APION (I. cent. A.D.), Gk. rhetorician; settled in Rome (80 A.D.); most of his works are lost; they included a commentary on Homer, history of Egypt, etc.

APIS, the sacred bull worshipped by the ancient Egyptians, who was supposed to be the incarnation of Osiris, after Râ, the chief of the Egyptian gods. The black bull chosen had certain distinguishing marks; it was tended with great ceremony; at the end of twenty-five years it was killed and buried with solemn state in the city of Memphis; after which search was made for another bull bearing the identical marks.

APIUM GRAVEOLENS=Celery (q.v.).

APLITE, fine-grained whitish or pink rock, consisting chiefly of quartz and felspar, occurring as dykes in granitic bosses, having cooled at a later period than the latter.

APNŒA, temporary cessation of breathing, due to the blood containing more than its normal amount of oxygen.

APOCALYPSE (Gk. *apokalypsis*, revelation), a work disclosing the hidden; applied to various Jewish and Christian writings grouped as Apocalyptic Literature, and to Book of *Revelation* (q.v.). **Apocalyptic Literature** dates roughly from the II. cent. B.C. to the IV. A.D., though there are some stray examples of later date. The struggles through which the

Jewish people had gone, and the unrealised Messianic hope produced a number of writings, many anonymous or pseudonymous, which, written sometimes in the name of the early patriarchs, were supposed to reveal the future. Various myths which were interpreted as prophecy were combined with them. A. is a later phase of Jewish religion than prophecy, for while the work of the prophets was mainly moral and reforming, that of a. was dualistic in tone (i.e. this present world is evil, and will soon come to an end). In the Old Testament, the chief a. passages are *Isaiah* 24-27, 33, 34-35, *Ezekiel* 38-39, *Daniel*, and *Zechariah* 12-14. These date roughly from 180 B.C. *Daniel* is the most important and the only wholly a. book. Outside the Old Testament the Book of *Enoch* (existing in Ethiopic) is by far the most important. In *Enoch* (q.v.) are fragments of a Book of Noah. Other writings are the *Testaments of the XII. Patriarchs*, originally in Hebrew, II. cent. A.D.; *Psalms of Solomon*, Pharisaic Gk. book, I. cent. B.C.; *Apocalypse of Baruch*, existing in Syriac and Gk. versions; *Esra*, originally Hebrew, existing in several versions; *Book of the Secrets of Enoch* (Slavonic), I. cent. A.D.; various other apocalypses, many of which are lost. Some of these writings have influenced New Testament writers and are exceedingly important. In New Testament the a. passages are *Mark* 13 (= *Matthew* 24, *Luke* 21), a Jewish apocalypse worked in by the editor, *2 Thessalonians* 2 (representing earlier stage of St. Paul's thought), and *Revelation* (q.v.), only a. in New Testament. There are various uncanonical a. works, e.g. *Shepherd of Hermas* (q.v.), *Apocalypse of Peter*, etc. A. thought ceased in Judaism, and in Christianity was soon transcended.

Works and editions by R. H. Charles and M. R. James. **Apocalyptic Number**, number 666, said in *Revelation* 13¹⁸ to be number of the beast. In both Gk. and Hebrew, numbers signify letters; hence several solutions of the cypher, among them 'Neron Kesar,' the Emperor Nero.

APOCARPOUS, see **FLOWER**.

APOCRISIARII, ecclesiastical representatives in early Church, of popes and patriarchs at Imperial Court, and of abb's at ecclesiastical superiors' courts.

APOCRYPHA.—This term is generally made to include a large body of lit. which falls into several groups.

(1) The **Apocrypha proper**, those books which are not recognised by Protestants or by the Church of England as of equal authority with the Old and New Testaments. These are (a) *I. and II. Esdras* (called sometimes 3 and 4 Ezra); *I. Esdras* is an edition of canonical *Esra*, and *II. Esdras* a I. cent. Apocalypse with really nothing to do with the other books called by the same name. (b) *I. and II. Maccabees*; *I. Maccabees* contains history of Jews, 175-135 B.C., and was written in Hebrew about 100 B.C. and translated into Greek; *II. Maccabees*, an epitome of another work, deals with 176-161 B.C.: written before 70 A.D. (c) *Tobit*, a didactic narrative: date uncertain, not later than I. cent. A.D. (d) *Judith*, a romance, probably of I. cent. B.C. (e) The *Additions to Daniel* (*Song of the Three Holy Children*, *History of Susannah*, and *Bel and the Dragon*), probably about I. cent. B.C. (f) The *Additions to Esther*, late Greek, found in Gk. versions of that book. (g) *Wisdom of Solomon*, written in Greek, I. cent. B.C. (h) *Ecclesiasticus*, written in Hebrew (original partly preserved), II. cent. B.C., translated into Greek. (i) *Baruch*, composite, written in Greek, latter part I. cent. A.D., and appended thereto, *Epistle of Jeremy* and *Prayer of Manasses*. These are all in the Vulgate of St. Jerome. (j) The Septuagint also includes *III. Maccabees*, a pseudo-hist. work written about the time of Christ, and *IV. Maccabees*, written before destruction of Jerusalem. (A so-called 'V' *Maccabees* is only a compilation).

(2) There are, besides, a considerable number of Jewish works, many of them apocalypses, some only recently discovered, which are of great importance for Jewish history of immediately pre-Christian times,

such as the *Book of Enoch*, *Psalms of Solomon*, *Assumption of Moses*, *Ascension of Isaiah*, *Testaments of the XII. Patriarchs*, *Testament of Abraham*, *Apocalypse of Baruch*, *Sibylline Oracles*, etc.

(3) The New Testament Apocrypha, some works of which nearly attained canonicity:—*The Gospel according to the Hebrews* (only fragments preserved), written in Hebrew, trans. into Greek and Latin by Jerome; *Gospel according to the Egyptians*, c. 150 A.D., only fragments; *Protevangel of James*, written in Egypt c. 100 A.D.; *Gospel of Nicodemus*, date uncertain; *Gospel of Peter*, a part of which was discovered in 1886, and others which have entirely perished or exist only in very small fragments. Various apocryphal Acts, including *Acts of John* and *Acts of Paul*. Amongst apocryphal Epistles are the so-called *Letters of Christ and Abgarus* (King of Edessa) to each other, probably composed about 200. Other *Epistles of Paul* (certainly spurious), *Clement*, and *Ignatius*. Among Apocalypses, *The Shepherd of Hermas* (included in some manuscripts of the New Testament) and *The Apocalypse of Peter* are important.

See Swete, *Old Testament in Greek*, vol. II. for (1)—the most convenient edition in English of the Apocrypha proper; for (2) and (3) various separate editions and articles, etc., by R. H. Charles and others: editions of the N.T. Apocrypha by Tischendorf, in *Temple Bible* in English, also for recently discovered sayings of Jesus, *The Logia*, edit. by Grenfell and Hunt; and *Two New Gospel Fragments*, Swete—interesting and important.

APODICTIC, incontrovertibly demonstrated (logic).

APOGEE, moon's position when farthest from earth; *perigee*, when nearest. See **ANOMALY**.

APOLDA (51° 2' N., 11° 30' E.), town, Saxony; woollen manufactures. Pop. (1910) 22,600.

APOLIMA (c. 13° 50' S., 172° 10' W.), island, Samoan Islands, Pacific.

APOLLINARIS (d. 390 A.D.), bp. of Laodicea (Syria); was strongly opposed to Arianism (but denied real humanity of Christ), and was associated with his f. in reproducing the Old Testament in verse and the New T. in the form of dialogue.—Those who followed him were called **Apollinarians**.

APOLLINARIS SIDONIUS, CAIUS SOLLIUS (d. 487 A.D.), bp. of Arverna (Clermont); author of *Panegyrica*, *Letters*, and *Poems*, which are of considerable hist. value for the light which they shed upon the events of the V. cent.

APOLLINARIS SPRING, well in Ahrtal, Rhineland, from which A. water, an alkaline drink, is obtained.

APOLLO (classical myth.), the god of pastures, of poetry and music, of oracles; the protector of youth. He was the son of Zeus and Leto, twin-brother of Artemis, and was born on Mount Cynthus, in the island of Delos, whither his mother had fled to escape the wrath of Hera. He is generally confounded with the sun-god, Helios, and thus becomes Phoebus-Apollo, the god of light, who illumines the world, warms the pastures, and brings forth the kindly fruits of the earth. He is also pre-eminently the god of prophecy, and the temple dedicated to his worship at Delphi, in Greece, was the most famous oracle of the ancient world. The most famous statue of the god is that known as the *Apollo Belvedere*, which originally stood on Mount Actium, and is now in the Vatican.

APOLLODORUS (fl. 140 B.C.), Gk. author, who wrote a valuable treatise on classical mythology.

APOLLODORUS (fl. 300–280 B.C.), a famous writer of Attic comedy, who is said to have produced upwards of forty plays.

APOLLONIUS MOLON (fl. 69 B.C.), Gk. rhetorician, from whom Caesar and Cicero took lessons.

APOLLONIUS OF ALEXANDRIA, a famous grammarian who flourished in the II. cent. A.D., and who is credited with being the first to treat grammar scientifically.

APOLLONIUS OF PERGA (fl. 250–220 B.C.), Gk. geometer; is ranked with Euclid and Archimedes

as one of the founders of mathematical science, and was known as 'The Great Geometer.' His famous treatise on *Conics* was in eight books, four of which survive in Greek, three in Arabic, while the eighth has perished.

APOLLONIUS OF RHODES (222–181 B.C.) Gk. epic poet and rhetorician; pupil of Callimachus; author of the *Argonautica*, a lengthy epic dealing with the story of the Argonauts; Eng. trans. by Way (1901).

APOLLONIUS OF TYANA, Gk. philosopher; b. about four years before the Christian era; he studied at Tarsus and *Egæa*, and became a teacher of the Neo-Pythagorean school. He travelled extensively in Asia Minor, visited India and other places, and upon his return was credited with the powers of second sight and the working of miracles. His history was written after his death by Philostratus.

APOLLONIUS OF TYRE, hero of an early mediæval romance, derived from a Gk. original. The story found its way into most European languages, was incorporated by Gower in his *Confessio Amantis*, upon which version Shakespeare founded his *Pericles, Prince of Tyre*.

APOLLONIUS THE SOPHIST (I. cent. A.D.), grammarian of Alexandria, who compiled a Homeric lexicon.

APOLLOS, Alexandrine Jew, associated as preacher with St. Paul at Corinth and Ephesus; held by Luther and others to have been author of the *Epistle to the Hebrews*.

APOLLYON (Gk. 'the destroyer'), the fiend with whom Christian fights in the *Pilgrim's Progress*. Bunyan took the name from *Revelation* 9th.

APOLOGETICS, the name given to the systematic defence by Christians of their own religion. Among famous apologetic works are those of Justin Martyr, Origen, and Augustine in the primitive Church, Anselm and St. Thomas Aquinas in mediæval times, and in the XVIII. cent. Paley and Bp. Butler. In the XIX. cent., however, the lines of defence and attack changed somewhat. The following are some of the arguments that have been used:—

THE ARGUMENT FROM NATURE.—The mystery of life which no one can completely explain suggests a Creator; further, the argument from design—what only mind can interpret only mind can create; again, an effect must have a cause; thus for various reasons it is possible to believe in God entirely apart from the idea of Revelation.

THE UNIVERSALITY OF THE BELIEF IN GOD.—Belief in a god or gods is found among all nations. The idea of God answers to our moral nature, and God is the highest possible object of thought and the ground of thought.

THE SPECIFICALLY CHRISTIAN ARGUMENTS.—Firstly, the evidence for and importance of the miraculous; then the change wrought by Christianity in its first disciples and in subsequent times (these two lines of defence often connected, e.g. the Resurrection, the difficulty of explaining it away and effect of it on the disciples). Again, the ministering of Christianity and the Church to the needs of those who believe in them and who cannot find satisfaction elsewhere.

In the XIX. cent. other lines of apologetic are coming into greater prominence: (1) A tendency to emphasise the moral rather than the miraculous; (2) the importance of Evolution in religion—this argument turned back on opponents; (3) the study of comparative religions shows Christianity as the perfection of imperfect faiths, again an adverse argument turned round; (4) psychical research shows existence of other and deeper realities: on the whole easier for Christians than non-Christians.

APOLOGUE, short moral fable (g.v.) or allegory.

APOLYTIKON, dismissal hymn in liturgy of Gk. Church.

APONEUROSIS, a broad tendinous expansion of fibrous tissue, serving to attach a muscle.

APOPHYLLITE ($H_2KCa_2(SiO_3)_6 + 4\frac{1}{2}H_2O$), mineral of Zoolite group, occurring as colourless, reddish, greenish, or opaque white tetragonal crystals with peculiar optical properties; found in amygdaloidal cavities in igneous rocks.

APOPHYSIS (anat.), a bony prominence; (bot.) a swelling under the aporo-case of certain mosses.

APOPLEXY, sudden unconsciousness, without any essential change in the pulse and respiration, resulting from cerebral hæmorrhage, embolism, or thrombosis. The unconsciousness must be distinguished from that due to epilepsy, syncope, uræmia, alcoholic or narcotic poisoning. The onset of the attack may sometimes be less sudden, and accompanied by headache, giddiness, confusion of the mind, or loss of power in a limb. The person may sink to coma and death, or he may recover after a short or a prolonged time, a certain degree of paralysis usually remaining, which most frequently affects one side of the body.

APOROSA, group of corals with non-perforated corallum.

APOSIOFESIS (Gk. 'becoming silent'), rhetorical trick by which a speaker leaves something unsaid, as 'He cried—, but no, I cannot repeat his words!'

A POSTERIORI, method of reasoning which proceeds from effects to causes; experimental, based on induction from observed facts. It is opposed to *a priori* reasoning which proceeds from assumptions to their necessary consequences, from causes to effects.

APOSTIL, marginal annotation.

APOSTLE, one sent upon a mission, particularly by Jesus Christ. The Twelve Apostles were Simon Peter, Andrew, John (s. of Zebedee), James (his bro.), Philip, Bartholomew, Thomas, Matthew, Thaddæus, Simon, James (s. of Alphaeus), and Judas Iscariot. Matthias was chosen in the place of Judas, afterwards. 'The Apostle of the Ardennes' was St. Hubert, bp. of Liège (656-730); 'of the English,' St. Augustine (d. 607); 'of the French,' St. Denis (III. cent.); 'of the Gentiles,' St. Paul; 'of Germany,' St. Boniface (680-755); 'of the Highlanders,' St. Columba (521-97); 'of Hungary,' St. Anastasius (954-1044); 'of the Indies' (West), Bartolomé de Las Casas (1474-1500), and Rev. John Eliot (1603-90); 'of the Indies' (East), St. Francis Xavier (1506-52); 'of Ireland,' St. Patrick (d. 493); 'of the North,' Anscarus (801-64); 'of the Picts,' St. Ninian (IV.-V. cent.); 'of Scot. Reformation,' John Knox (1505-72); and 'of the Slavs,' St. Cyril (IX. cent.).

APOSTLE SPOONS, usually of silver, and bearing figures of the apostles for handles, were common baptismal gifts during the reigns of the Tudor and early Stuart sovereigns.

APOSTLES' CREED, see CREEDS.

APOSTOLIC FATHERS, the name given (first in XVII. cent.) to the Christian Fathers of the two generations after the Apostolic age, roughly, 70-130 A.D. These are (1) St. Clement, who writes from the Church of Rome to the Church of Corinth (second Epistle not genuine); (2) St. Ignatius, bp. of Antioch, martyred c. 110 A.D. Seven Epistles of his are genuine—most important as showing growth of episcopacy; (3) Polycarp, traditional disciple of St. John; P. wrote a letter to the Philippian Church; martyred 155.

The term Apostolic Fathers is used to include also these writings: (4) *Epistle of Barnabas*, probably not work of the companion of St. Paul; (5) *Shepherd of Hermas*, a document of the early Roman Church; (6) *Teaching of the Twelve Apostles*, a most important document, probably borrowed in part from a Jewish source, *The Two Ways*; the Teaching (Gk. 'Didache') was only recently discovered. (7) *Exposition of the Lord's Oracles*, by Papias, bp. of Hierapolis, only preserved in fragments.

The theol. of the A. F's, though very devout and even passionate in loyalty, shows a marked falling off from St. Paul and St. John.

H. B. Swete, *Patristic Study*; editions of Ap. Fathers by Cotelier, Lightfoot, Harnack, etc.

APOSTOLIC LETTERS, papal documents; Epistles of the Apostles.

APOSTOLIC MAJESTY, title conferred on Hungarian kings; now borne by Emperor of Austria.

APOSTOLIC SEE, the see of an apostle, e.g. Antioch and Alexandria; now generally applied to Rome as See of St. Peter.

APOSTOLIC SUCCESSION, a distinctive doctrine of Catholic Christianity, that the bp's are successors of the Apostles, and that the episcopal order is conveyed by consecration and laying on of hands. According to the Protestant view the bp. is simply an official, and episcopacy not (as with Catholics) something necessary and divinely ordained.

APOSTOLICAL CONSTITUTIONS, *THE*, in eight books, purported to have been written by the Apostles, and have been accepted as genuine by many theologians in ancient and modern times. The growth of a critical spirit has shown the baselessness of their claim. They are, however, of great value for the history of the Church of the age from which they date. They are only one of a series of collections referring to Church order and discipline which came to be written. The *Constitutions* are based on the *Didascalia Apostolorum* (written in Greek but only existing entire in Syriac). The *Didache* (or 'Teaching of the Twelve Apostles') and other works seem also to have been made use of. The *Constitutions* were written in Greek, probably in Syria, and somewhere towards the close of the IV. cent.

Translation of Apost. Constit. in 'Ante-Nicene Christian Library,' book viii.

APOSTOLICI, term applied to certain Christian sects regarded as heretics—first thus called c. 200 A.D. (mentioned by Epiphanius); these lasted till IV. cent.; then to Ger. sect in XII. cent. who abstained from marriage and denied generally Catholic ritual and sacramentalism; again in Italy c. 1280-1300—led by Dolcino of Novara (executed 1307); only occasionally in XIV. cent.

APOSTOLIUS, MICHAEL (XV. cent.), Gk. theologian; zealous Platonist.

APOSTROPHE (Gk. turning away).—(1) Term in Gk. rhetoric for suspension of discourse, in order to address a person present, and ultimately applied to such address; hence Eng. application to passionate invocation of any kind. (2) Sign used to denote omission of letter, as in possessive case where original vowel of inflection has been omitted.

APOTACTICS, APOTACTITES, early Christian sect who adopted poverty.

APOTHECARY, one who prepares, sells, and prescribes drugs. An a. differs from a chemist and druggist in that he may prescribe drugs in addition to compounding and dispensing them. The Apothecaries' Society of London and Apothecaries' Hall in Dublin are empowered to grant licences to practise med. For Apothecaries' weights and measures, see WEIGHTS AND MEASURES.

APOTHEGM (also *apophthegm*), a terse remark or saying, under which heading many brief proverbs might be classed.

APOTHEOSIS, deification; due to ancestor worship; frequently found in ancient Greece, where dead heroes came to be regarded as gods or demigods. In Rome it really began with the Empire, and Emperors were called *divi*; this continued even after conversion of Empire to Christianity. According to Herbert Spencer and others, this is the origin of religion. A. is also used figuratively in the sense of glorification.

APOXYOMENOS, celebrated marble statue in Vatican, representing athlete scraping himself with a strigil; supposed to be copy of statue of Lysippus (q.v.) on same subject.

APPALACHIAN MOUNTAINS (39° N., 77° 30' W.), extend over 1300 miles from N. to S. along

Atlantic coast of U.S.A.; divided by Hudson and Richelieu valley and Lake Champlain into two unequal groups—Green and White Mountains to N., Alleghenies and Blue Mountains to S. Highest point is Black Dome (6707 ft.) in Blue Mountains, N. Carolina. A. valley divides system lengthwise in S. Railways cross by Mohawk and Potomac valleys, Cumberland and Swannanoa Gaps. Iron ore abounds. **APPALACHICOLA** (30° 24' N., 85° W.), river, Florida, U.S.A.

APPANAGE, provision made by a king, noble, or other person for the younger members of his family, other than the direct heir; might take the form of a grant of lands, the bestowal of an office, or a gift in money; also anything of a dependent condition.

APPARITION, visualised subconscious ideation, often due to intense emotional experience, or appearance due to suprasensual agencies (ghost or wraith); distinct from an illusion.

APPAUMÉE, heraldic term for a hand open, erect, with palm showing.

APPEAL, COURT OF, consists of the Lord Chancellor, the Lord Chief Justice of England, and the Master of the Rolls as *ex-officio* judges, and five ordinary judges, whose title is that of Lord Justice of Appeal. An appeal from a decision of a judge, or a judge and jury, provided that decision be a final judgment, may be entered within three months from the time when the judgment or order was signed. All appeals are by notice of motion, and the appellant must, at least one week before the appeal is likely to come on, leave three copies of the notice of appeal, three copies of the judgment, and three copies of the pleadings. The respondent to the appeal may apply to the Court of Appeal for security for costs, and this is usually granted if the appellant is poor, or the appeal is of a frivolous nature. A party dissatisfied with a judgment or order may apply for a new trial within eight days after the trial, if it took place in London or Middlesex. If the trial took place elsewhere, notice of motion for a new trial must be served within seven days after the end of the Circuit in which the trial took place. An appeal may be based on the following grounds: misdirection of the jury, or rejection or wrong admission of evidence; discovery of fresh evidence; jury's verdict against weight of evidence; that there was no evidence to go to the jury; or that the defeated party was taken by surprise. In U.S.A. the 9 Circuit C's of A. are composed of 3 (or 2) judges chosen from: the Supreme Court justice for the circuit, and the circuit and district judges (no judge who tried original case to try appeal).

APPEAL, CRIMINAL, a person convicted on indictment, criminal information, or Coroner's inquisition, or as an incorrigible rogue, has a right of appeal to the Court of Criminal Appeal, on any ground which involves a question of law alone. If the ground of complaint involves a question of fact alone, or a question of mixed law and fact, or is directed against the severity of the sentence, the leave of the Court of Criminal Appeal, or a certificate from the judge who tried the prisoner that it is a fit case for appeal, is necessary before an appeal can be heard. Notice of appeal, or of an application for leave to appeal, must be given within ten days of conviction. The court has power to quash a conviction, or to vary a sentence. It has also power to impose a heavier sentence than that imposed by the judge at the trial.

APPELLANTS (*Lords Appellants*), name given to Lords Gloucester, Arundel, Derby, Nottingham, and Warwick, who in 1383 appealed (legal term for 'accused') favourites of Richard II. of treason.

APPENDICITIS, inflammation of the vermiform appendix of the large intestine, which is a slender, blind tube arising from the inner and back part of the caecum about three-quarters of an inch below the ileo-caecal junction, its average length being about three and a half inches. The disease occurs most frequently between the ages of ten and thirty, more

often in males than females. It is due to bacterial infection, and may range from a simple catarrh to gangrene of the wall of the appendix. Concretions may, as a result of catarrhal inflammation, be formed in the tube from its fecal contents, resembling date or cherry stones, for which they have been mistaken. Sudden pain, tenderness in the lower part of the right side of the abdomen, and often vomiting, are the first symptoms. The treatment, in slight cases, with the symptoms improving within twenty-four hours, is to relieve the pain with warm fomentations or an ice-bag on the abdomen, and give nothing by the mouth but sips of hot water; and in severe cases, which are not improving, prompt and early operation.

APPENDICULARIA, genus of free sea-swimming Tunicata (*g.v.*), resembling larval stages of other tunicate genera.

APPENDICULATA, term for group of coelomate animals with hollow lateral appendages, comprising Chetopoda, Rotifera, and Arthropoda.

APPENZELL—(1) (47° 20' N., 9° 22' E.) German-speaking canton, N.E. Switzerland, 1300 to 8000 ft. above sea-level; divided into Outer Rhodes (Prot.), with cotton and linen-weaving and dyeing, and Inner Rhodes (R.C.), with agriculture. Area, 162 sq. miles. Pop. (1910) 72,400. (2) (47° 20' N., 9° 25' E.) capital of Inner Rhodes. Pop. 4600.

APPERCEPTION, conscious process of perceiving (psychology).

APPERLEY, CHARLES JAMES (1777-1843), Eng. sporting author and journalist.

APPERT, BENJAMIN NICOLAS MARIE (1797-1847), Fr. philanthropist; devoted many years to improving the prison system, upon which subject he wrote several books; Legion of Honour (1835).

APPIAN OF ALEXANDRIA, Rom. historian who lived during reign of Trajan.

APPIAN WAY, VIA APPIA, ancient road, Rome to Tarentum.

APPIANI, ANDREA (1754-1817), Ital. fresco painter; achieved great success as a follower of Correggio; was patronised by Napoleon, whom he painted; much of his finest work is in the palace at Milan.

APPIN (56° 34' N., 5° 22' W.), district, E. of Loch Linnhe, Argyllshire, Scotland.

APPLE, fruit of *Pyrus malus*, tree belonging to order Rosaceae; originally wild (crab-a.) in Asia and Europe, now cultivated in over 2000 species in temperate countries for eating, cooking, and manufacture of cider (*g.v.*). Many other fruits, e.g. custard apple, pine-apple, egg apple, have nothing but the name in common.

(1) The 'a. of Discord' was a golden apple thrown on the table at an Olympian banquet by Discord, and contended for by Hera, Athena, and Aphrodite. Paris, of Troy, when called upon to make the award, gave it to Aphrodite, and thereupon incurred the wrath of the two other deities. (2) When Hippomenes raced with Atalanta (*g.v.*) he cast three golden apples before her, and she, stopping to pick them up, lost the race. (3) The golden apples of the Hesperides (*g.v.*) were guarded by a dragon, and the gathering of these by Heracles constituted his twelfth labour. (4) 'A. of the eye,' literary epithet referring to something held in great regard. (5) 'A. of Sodom,' Dead Sea fruit, fair without, but full of ashes. (6) 'Adam's a.' (*g.v.*).

APPLEBY (54° 35' N., 2° 29' W.), town, Westmoreland, England.

APPLETON (44° 15' N., 88° 25' W.), town, Wisconsin, U.S.A.; univ.; paper-making. Pop. (1910) 16,773.

APPLETON, DANIEL (1785-1849), Amer. publisher, founder of firm D. A. & Co. One of important publications was *New American Cyclopaedia*.

APPLETON, NATHAN (1779-1861), Amer. manufacturer and politician; introduced power-loom.

APPOGGIATURA, musical term for an accessory tone preceding an essential one; a kind of grace-note: it is of two kinds, 'short' and 'long.'

APPOINTMENT, POWER OF, in law, the power which is lodged in a person to realise property for the benefit of himself, or others.

APPOMATTOX COURT-HOUSE (37° 24' N., 78° 49' W.), village, Virginia. Here the Confederate army under Lee surrendered to Grant, 1865.

APPONY, ALBERT, Count (1846-), Hungarian statesman.

APPORTIONMENT, legal term for the division of profits or liabilities in any undertaking; the proper distribution of rents from property in which there are general proprietors.

APPOSITION, grammatical term for placing as subject or object in sentence independent words or phrases explanatory or extensive of each other, not connected by conjunction or relative pronoun. *E.g.* 'The third day comes a frost, a killing frost'; 'This royal throne of kings, this sceptred isle, etc.'

APPREHENSION, term for arrest in Scots law; conception or consciousness of an object without applying criticism. See **PSYCHOLOGY**.

APPRENTICE, person who serves another in his profession, or trade, for a fixed period of years. The custom of apprenticeship dates back to about the latter half of the XII. cent., and during the ensuing period, down to comparatively modern times, the term of service was fixed at seven years, after which the a. became a member of the trade guild. The period of apprenticeship is now five years, or less. A master may administer corporal punishment to an apprentice who is under age. The agreement between the parties can only be cancelled by mutual consent, by the bankruptcy or death of the master, or the gross misconduct of the a.

APPROPRIATION, act of setting apart; to assume proprietorship in something; in ecclesiastical law, the annexation of a benefice.

APPROPRIATION ACTS, Eng. laws appropriating public funds for the use of the Government administration.

APRAKSI, THEODOR MATRYEEVICH (1671-1728), Russ. general; prominent throughout reign of Peter the Great.

APRICOT (*Prunus armeniaca*), tree with ruddy golden single-stoned succulent fruit, originally cultivated in the East, now also in Europe and N. America. The kernels of some varieties, especially Musch-Musch, are edible.

APRIL, 2nd month in the ancient Roman calendar, and the 4th in the modern. It is suggested that the name is derived from Lat. *aperire*, meaning 'to open,' in allusion to the budding of plants and flowers.

A PRIORI, see **A POSTERIORI**.

APSARAS (Hindu myth.), female spirits who conduct the fallen warriors to paradise.

APSE, semicircular or polygonal covered recess at end of temple, basilica, or church, a feature in religious arch. from a little before the Christian era. In churches the a. most commonly forms the chancel at the E. end, but transepts often terminate in a's.

APSIS, point in the orbit nearest to or farthest from the centre of attraction, like aphelion or perihelion of a planet, or apogee and perigee of the moon.

APT (43° 52' N., 5° 25' E.), town, S.E. France. Pop. 6000.

APTERYGOTA, **APTERA**, widely distributed primitive wingless insects living in damp, dark places, consisting of two orders, bristle-tails (*Thysanura*) and spring-tails (*Collembola*); thorax and abdomen not well defined; they do not undergo metamorphosis, the young being miniature adults.

APTERYX, bird of same class as ostrich, of nocturnal habits, peculiar to New Zealand; rudimentary wings; feathers hair-like, loose, and pendent; eggs of extraordinary size.

APTIAN, marls, clays, and greensands constituting European subdivision of Lower Cretaceous rocks.

APULEIUS, LUCIUS (II. cent.), Latin philosopher and satirist; b. Madaura, in Africa; studied at

Carthage and Athens; having m. a rich widow, he was accused by her family of having practised magic to gain her affections. His celebrated *Apologia*, which is still extant, was a successful vindication of his conduct. Apart from this work his fame rests chiefly upon the *Golden Ass*, a discursive romance containing the exquisite interlude concerning Cupid and Psyche, the work as a whole being a satire upon the vices of the age in general, and of the priesthood in particular. See trans. in Bohn's Classical Library.

APULIA (41° N., 16° E.), territorial division. S.E. Italy, including Foggia, Bari, Lecce; area, 7376 sq. miles; tableland in S., plain in N. Sheep, cattle, and horses are raised; fruits, grain, wine, olive oil produced. Chief ports are Brindisi, Bari, Taranto. Once inhabited by Apuli, Samnite tribe, A. belonged in turn to Romans, Ostrogoths, Lombards, Eastern Empire, Normans, Sicily, Italy. Pop. (1911) 2,123,600.

APURÉ (7° 15' N., 70° W.), affluent of Orinoco, Venezuela.

APURIMAC (13° S., 73° W.), river, joining Ucayali, Peru.

APURIMAC (14° 10' S., 72° 55' W.), department, Peru. Area, 8187 sq. miles. Pop. 133,000.

APUS, a species of phyllopora (see Entomotrachea), now thought to be extinct.

APYREXIA, absence of fever in the course of a disease; also the interval between rises of temperature in intermittent fevers.

AQUA FORTIS (=strong water), commercial nitric acid.

AQUE (Lat. 'waters'), Roman name for the sites of mineral springs.

AQUE CUTILLÆ (42° 24' N., 12° 58' E.), mineral spring, Italy.

AQUAMARINE, gem-stone; transparent blue to greenish blue variety of beryl.

AQUARI, Christians who used water instead of wine in the Eucharist.

AQUARIUM, receptacle for keeping living fresh-water or marine animals and plants for amusement or study. The difficulties of preserving natural conditions, chiefly in maintaining the necessary percentage of oxygen, has been overcome by various contrivances used in aquaria connected with biological stations. The finest marine aquaria are kept at Naples, Trieste, Rovigno, Monaco, Villefranche, and Banyuls, for studying Mediterranean fauna and flora; Plymouth, Brighton, Port Erin, Millport, St. Andrews, for Brit. marine biology and fisheries; others, at Heligoland, Hamburg, Bergen, Helder, and Roscoff. Numerous marine and lacustrine biological laboratories and aquaria have been founded in America, Japan, and elsewhere, and have been of inestimable value not only to the progress of science but to the rational exploitation of an essential part of the world's food supply.

AQUARIUS, eleventh zodiacal constellation, between Capricornus and Pisces, symbolised by ♒.

AQUATIC, living in the sea or in fresh water.—A. plants, see **Hydrophytes** (article **PLANTS**).

A. animals occur in almost every group of the animal kingdom. They include the majority of invertebrates, and the young stages of many creatures which in adult life are terrestrial or aerial. Among their many diversities two features are very common—bodies or projections from the body with large superficial area to facilitate floating, or actively moving, more or less paddle-like (often numerous) appendages for swimming; and more or less gill-like structures which can utilise the oxygen contained in water for purifying the blood.

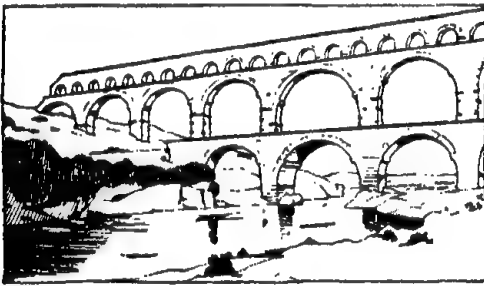
AQUATINT (Lat. *aqua*, water, and *tincta*, dyed), an etching, having somewhat the appearance of a wash-brush drawing, produced by the spaces being bitten in with acid.

AQUAVIVA, CLAUDIO (1542-1615), Ital. Jesuit;

5th general of Jesuit order (1579), which increased in influence under his able direction.

AQUEDUCT, artificial channel for conveying water flowing by gravitation, ordinarily, to supply the needs of a centre of population. In level districts traversed by rivers, like Egypt, Assyria, and Babylonia, and parts of the Levant, open canals with reservoirs were used in ancient times. The Phœnicians constructed waterworks of various kinds, for instance, subterranean channels in Cyprus and the towers for the artesian wells of Ras-el-Ain (Syria). Ancient Gk. a's were very efficient, and consisted of subterranean conduits, as well as basins and pipes of masonry, the best known examples being those of Samos, Athens, and Syracuse. The Romans, who devoted so much genius to the science and art of water supply, constructed long a's traversing valleys on a tier or tiers or arches. Rome was supplied with water by a dozen a's of a total length of over 300 miles. In the Provinces the magnificent existing testimonies to Roman enterprise are chiefly the beautiful Pont-du-Gard, part of the a. to Nîmes, consisting of three tiers of arches, dry masonry except for the cemented channel on top; the a. bridges at Segovia (800 yds. long), Merida, and Tarragona; the a. near Metz and Mainz; and many waterworks in N. Africa, Asia Minor, Dacia, and Greece. The a. of Pyrgos and the a. of Justinian supplying Constantinople are notable instances of early mediæval engineering.

The material for the construction of a's necessarily varies with its availability and the nature of the country traversed. In western N. America wood has been used; the so-called 'flumes' cross valleys



PONT DU GARD, NÎMES.

and are carried along steep slopes on trestles; the Californian flume, used for timber transport, is over 50 miles in length; the High-Line Canal, Colorado, is in places 28 ft. wide and 7 ft. deep, and the San Diego flume (35 miles) is remarkable for its bold design, crossing several hundred trestle bridges. With the progress in iron and steel manufacture and the improvements in concrete, modern water supply is conveyed through cast-iron or steel pipes, their cheapness generally making large masonry works dispensable. Brickwork and concrete are, of course, necessary where tunnelling, so-called cut-and-cover work, and foundations for pipes have to be resorted to. Manchester is supplied with about 50,000,000 gallons of water daily by the Thirlmere a., 96 miles long, of which 14 miles are tunnels. Liverpool receives about 40,000,000 gallons from N. Wales by the Vyrnwy a.; the water supply of Glasgow—one of the best in Europe: up to 100,000,000 gallons, from Loch Katrine—is conducted through tunnels and pipes and over bridges of masonry, or through cast-iron troughs across smaller glens. Vienna has a famous a. from springs in the Styrian Alps, 60 miles distant. The Nadrai a. and Tansa a. in India are probably the largest in existence. New York can receive up to 425,000,000 U.S. gallons through the Old and New Croton a. and the Bronx River conduit. Among the best known canal a's in Great Britain are the Barton a., carrying the Bridge-water over Manchester Ship Canal, and the Ellesmere Canal a., across the Dee.

AQUEOUS ROCKS, those stratified rocks which have been formed by moving waters, such as rivers. See Rocks.

'AQUIBA, BEN JOSEPH, Jewish Rabbi; head of a school at Jaffa; took part in the last revolt against Rome, and, being captured by Julius Severus, was flayed alive; was one of the first to reduce the Jewish traditions to a system.

AQUILA (the Eagle), constellation of N. hemisphere, S.E. of Lyra, known to the ancients.

AQUILA, CASPAR (1488–1560), Ger. reformer; friend of Luther, whom he aided in trans. of Old Testament.

AQUILA DEGLI ABRUZZI (42° 20' N., 13° 25' E.). (1) town, Italy; XVI. cent. citadel. Pop., commune (1911), 21,900. (2) province, Italy; area, 2484 sq. miles. Pop. (1910) 396,600.

AQUILA OF PONTUS (fl. 130 A.D.), convert to Jewish religion; made translation (utilised by Origen in his *Hexapla*) of Old Testament into Gk.

AQUILA ROMANUS (III. cent. A.D.), Lat. scholar, who wrote a work entitled *De Figuris Sententiarum et Elocutionis*.

AQUILEIA (45° 50' N., 13° 5' E.), town, Austria; Roman colony c. 180 B.C.; fortified 168 A.D.; almost totally destroyed by Attila, 452; St. Ambrose held council here, 381; seat of patriarchate till XVIII. cent.

AQUILON, the north wind.

AQUINAS, THOMAS—i.e. of Aquino—(c. 1227–74), theologian and saint; the *Angelic Doctor*; studied at Naples; became Dominican when seventeen; lectured at Rome and Bologna; canonised, 1323; greatest theologian of Western Church since St. Augustine, and greatest of the Schoolmen; best work, *Summa Theologiae*. According to A., reason and revelation are the two sources of knowledge; revelation is based partly on Scripture, partly on the Church; reason and revelation cannot be contradictory, since they both rest on truth; religion and philosophy are complementary, not contradictory. Philosophically A. owes much to Aristotle and Pseudo-Dionysius.

Rickaby, *Scholasticism*; O'Neill, *New Things and Old in St. Thomas Aquinas*.

AQUINO (41° 30' N., 13° 43' E.), cathedral town, Italy; birthplace of St. Thomas Aquinas.

AQUITAINE, old province, in Garonne valley, France; held in turn by Romans, Visigoths, Franks; attained independence under successors of Charlemagne; came to Louis VII. of France through wife Eleanor, who subsequently m. Henry II. of England, uniting A. to Eng. crown, 1152; remained Eng. possession till c. 1451, when passed to France.

ARA (=censer or altar), a Southern constellation; only about twenty stars are visible to unaided eye.

ARABELLA STUART, see STUART, ARABELLA.

ARABESQUE, Moorish ornamental frieze or border, consisting of botanical figures—flowers, foliage, and tendrils—often interlaced in a most fantastic manner. Fine examples are to be seen in the Alhambra and other Moorish palaces of Spain, in some of the Span. cathedrals, and in many of the great Ital. cities.

ARABGIR (38° 58' N., 38° 25' E.), town, Asiatic Turkey. Estimated pop. 25,000.

ARABI PASHA (c. 1839–1912), Egyptian soldier, revolutionary leader, and war minister; b. Lower Egypt; started national Egyptian party; defeated by Wolseley at Tel-el-Kebir (1882); exiled to Ceylon; returned to Egypt (1901).

ARABIA (c. 12° 43' to 34° 29' N., 35° to 59° 30' E.), most westerly peninsula, Asia, extending southwards from Persian Gulf and Gulf of Oman on E. and Red Sea on W.; united to Africa at Isthmus of Suez; length, c. 1600 miles; average breadth, c. 800 miles; area, c. 1,200,000 sq. miles. General surface is plateau with gradual decline from W. and S. to E. and N.; this plateau rises from elevation of 2500 ft. in N. to over 7000 ft. in S.W., and is

bounded by mountain ranges in S. and W.; between mountains and sea is strip of low fertile land which continues along practically whole of W. coast and about 400 miles along S. coast. Ptolemy subdivided country into *A. Petraea* in N.W., *A. Felix*, S. and W. coasts, and *A. Deserta*, remainder; but this division is obsolete. Northern part of A. is desert region, including Syrian Desert and Nafud or Rod Desert; to N.W. is peninsula of Sinai. Central A. is mainly steppe region interspersed with fertile tracts; in W. is Hejaz, in E. El Hasa, and between them is Nejd. Southern A. includes great Dahna Desert in interior, Asir and Yemen on W. coast, Hadramut on S. coast, Oman on E. coast. Chief rivers are Wadi Hamd in Hejaz, Wadi Rumma in Nejd, Wadi Shahrhan, Wadi Boshra, Wadi Taraba in Asir. Principal mountains are Tehama range in Hejaz, Asir, and Yemen, all of which it divides lengthwise; among highest peaks are Jebel Sabur, Jebel Hadur; Shammar range in Nejd—highest peak, Jebel

northern tribes also being under their sway for long. Mesopotamia, Persia, and Egypt all tried to subdue Arabs without success; Alexander of Macedon had arranged to invade country shortly before his death, and Romans made an unsuccessful invasion. For a long time struggle went on between Himyarites and Abyssinians, and latter held Yemen between 535 and 605, when former were restored by aid of Persia. Soon after this, however, arose Muhammad, who aimed at uniting whole of A. and establishing his religion; his followers overthrew Himyarites, and caliphate was established.

Reigns of first three caliphs were time of A.'s greatest prosperity, 632-656; Syria, Egypt, and Persia were conquered, and Muhammadan dominion spread over N. Africa and into Spain. Caliphs were of Omayyad dynasty from 658 to 750, when 'Abbasids succeeded, to be followed in turn by Fatimites in early X. cent. With growth of Muhammadan power in W., and removal of seat of government from

Damascus to Bagdad, A.'s importance gradually declined, and numerous independent principalities arose. Yemen was held by Egypt from about middle of XIII. cent., and with Hejaz came into hands of Turks in 1517. Latter has belonged to Turkey ever since, except for two short intervals, when it was held by Egypt; former regained virtual independence in 1633, and was ruled by native princes till 1871, when last native ruler was overthrown and state again passed to Turkey. Eastern state of Oman had meantime become of some importance, retaining independence for several cent's despite Persian attempts at conquest; from 1508 the chief town, Muscat, was held by Portuguese, who were finally banished in 1698, since when it has been ruled by native princes; included in Brit. sphere of influence, 1905. In



Fara; Akhdar Mountains in Oman; Mt. Sinai in N.W. There are volcanic hills in Yemen.

Climate generally is very dry and hot; in plains heat is excessive, in mountain regions of Yemen and Hadramut temperature is more moderate, and in Nejd great cold occurs in winter. Rainy season generally lasts from June till Sept. Simoon, a hot desert wind, blows from interior towards coast.

Geology.—Formation largely sandstone, with volcanic patches here and there; granite, limestone, and schists also occur.

History.—Thanks to many ancient inscriptions, recently discovered by Glaser and others, pre-Islamic history of A., formerly veiled in obscurity, is now traceable to period many cents. before Christian era, variously estimated at from IX. to XVI. cent. A.C. Among early kingdoms of which traces exist was that of Saba, which flourished from VIII. cent. B.C. onwards, and was ultimately superseded by Himyarite kingdom late in II. cent. A.C. Himyarite stronghold was at Yemen, and they attained great power, the

central A. Wahhabi empire was established about 1760 by Abd-ul-Wahhab, a religious reformer; Wahhabi dominions at one time included El Hasa, Nejd, Mecca; but they lost much of their power by war with Egypt, which ended in their defeat, 1818. They still hold Nejd, but their other territories are now independent or subject to Turkey.

Divisions.—Hejaz, Yemen, and El Hasa belong to Turkey, Aden to Britain; remainder is ruled by independent emirs and sheikhs. Britain has established sphere of influence in Hadramut, Oman, and district surrounding Aden. Peninsula of Sinai belongs to Egypt.

Language and Literature.—Oldest pre-Islamic poems are collection called the *mu allagât*, including poems by Imru'ul-Qais, Tarafa, Zuhair, Labid, 'Amr ibn Kulthûm, 'Antara, Al-Hârith ibn Hilliza (identity of last two doubtful). Of these Imru'ul-Qais and Zuhair rank, with Nâbigha Dhubyânî, as three greatest Arab poets of this period, to which Samauel, a poet of Jewish descent, also belongs. Earliest prose work is the *Koran*,

consisting of speeches and teaching of Muhammad, said to be revealed to him by an angel; it is written in rhymed prose; its arrangement is artificial, according to length of chapters. Among poets of Omayyad times were 'Umar Ibn Abi Rabia, many of whose poems were set to music and became popular songs; Al-Akhtal, who sang the valiant deeds of the caliphs; Ferazdaq, whose speciality was satire, and who was a confirmed plagiarist; and Jarir, rival of last-named satirist, and popular favourite. Chief poets of 'Abbasid period were Abu Nuwās, VIII. cent., Abu Tammām, and Buhturi, IX. cent.; Ibn Fārid was great mystic poet of XIII. cent., and Busiri (XIII. cent.) wrote poem on Muhammad. Among lexicographers and grammarians are Al-Khalil and Abu al-Walid al-Du'ali; historians, Muhammad ibn Ishaq, who wrote biography of Muhammad, and Tabori, author of universal history. There were many writers on philosophy, including Ibn Tufail and Ibn Rushd in XII. cent. *Book of 1001 Nights* ('Arabian Nights' Entertainments'), said to be translation from Persian. See also ARABS.

Resources and Productions.—A. has no forests, but there are long stretches of grass, which afford excellent pasture for horses, for which country has long been famed. Large numbers of camels, sheep, goats, and oxen are raised. Vegetable products are dates, coffee, cereals, fruits, spices, drugs, gums, resin, sugar, cotton. Minerals include silver, iron, lead, sulphur, precious stones. There are few manufactures; coarse linens and woollens made by Bedouin women, also hair bags. Trade is carried on chiefly by caravans, which bring quantities of merchandise both for internal use and to distribute among pilgrims; exports coffee, dates, figs, spices, drugs. Communications are chiefly by sea or caravan, but a railway is being built from Damascus to Mecca. Chief seaports, Maskat, on Gulf of Oman, Jeddah and Hodeida, on Red Sea; good harbour at Aden, on S. coast.

Inhabitants are traditionally of Arab and Ishmaelitic stocks; former represented by agricultural population round coast, latter by Bedouins of desert and central A. In S. are many Jews. Principal religion is Muhammadanism; every year pilgrimage, or *hajj*, is made to holy city, Mecca, by thousands of devotees. Pop. c. 5,000,000. See ARABS.

Travels of Niebuhr, Burckhardt, Burton, and Palgrave; Hogarth, *Penetration of Arabia* (1904); Zwemer, *Arabia, the Cradle of Islam* (1900); Sir W. M. Ramsay, *Historical Geography of Asia Minor* (1890); Huart, *Arabic Literature* (1903).

ARABIAN SEA (14° 40' N., 68° 58' E.), part of Ind. Ocean, between India and Arabia.

ARABIC FIGURES, see NUMERAL.

ARABICI (III. cent.), body of Christian materialists.

ARABIN, ARABIC ACID, (C₆H₄O₆)₂ + H₂O, white, amorphous precipitate, obtained by adding hydrochloric acid and alcohol to an aqueous solution of gum-arabic.

ARABISTAN (31° 50' N., 50° E.), province, Persia. Pop. c. 200,000.

ARABS, general name given to the people who at the present day inhabit, besides Arabia itself, parts of North Africa and Mesopotamia, and extensive districts on the coasts of the Red Sea and the Persian Gulf; and who conquered Spain and other parts of S. Europe in Middle Ages. The purest type is found in the neighbourhood of Hadramut and Yemen, and amongst the Bedouin nomads of the central Arabian desert. The A's of the coasts are often of very mixed descent. The pure-blooded A's are tall, lean, long-limbed, and muscular, brown-skinned, black-eyed, oval-faced, and with handsome features and beautiful teeth. They live simply and abstemiously, and are scrupulously clean in their habits. Their food consists of roughly ground wheat cakes, rice, locusts, mutton and camel's flesh, tea, coffee, butter, dates, etc. In character the Arabs are often proud, revengeful, and treacherous, but are capable of pity and gratitude, and are proverbially hospitable to strangers. Less

to their credit is the A. association with the African slave-trade, their victims, over a very long period, having been obtained from the Sudan, Somaliland, and other places. The European powers have made strenuous efforts to suppress this iniquitous traffic, but it was not until the end of the XIX. cent. that the trade was arrested to any extent. In 1873 the Sultan of Zanzibar signed a treaty whereby he undertook to suppress the traffic.

Arabian Philosophy, not properly an Arabian system of thought, but a phase of Aristotelianism, finding expression in the A. tongue, and somewhat modified by Oriental influences; its abstract nature is entirely foreign to the lyrical and prophetic genius of the country, and its greatest exponents are not strictly Arabs, but Jews, Persians, and Spaniards. Its development is due to the expulsion of the Nestorian Christians from Syria in the V. cent.; those, finding refuge and patronage in Persia, introduced thither their Gk. science and philosophy. By the VIII. and IX. cents. there were numerous translations, first into Syriac and thence into Arabic, of Aristotle's writings, which henceforth received faithful interpretation but little further development. This learning was carried into Europe by the march of the victorious armies of Islamism; whence the rise of western schools, at Cordova, Granada, Toledo, Sevilla, Murcia, Valencia, and Almeria, as well as the eastern schools at Baghdad, Basra, Bokhara, and Kufa. The most flourishing period extended from the IX. cent. to the XII., and while Christian Europe was in intellectual darkness, Andalusia, under Muhammadanism, was a centre for the diffusion of Eastern learning; books commanded high prices, there was keen search for manuscripts, and in the mosques, lectures on law, science, lit., and religion were delivered to crowded audiences.

The chief A. philosophers were Al-Kindi of Baghdad, IX. cent., translator of Aristotle and leader of the first philosophic revolt against Muhammadanism; Al-Farabi, X. cent.; Avicenna the Persian, XI. cent.; Al-Hazen; Avempace of Cordova, XII. cent.; Al-Gazel; Averroes, XII. cent., the last great Muslim thinker in the West. Their teachings profoundly influenced the later Scholastics. Thus the influence of Avicenna, who approached philosophy from a religious standpoint, and taught a doctrine of emanation, of active intellect common to all men, derived from God and returning to God, is evident in Dante and the Mystics; Averroes, whose philosophy is mainly Aristotelian, and who denies immortality and affirms a return to the 'Over-soul,' an emanation from God, influences Roger Bacon, Pomponazzi (q.v.), and Duns Scotus.

The A. philosophers were all of good family and held important positions in society. Much given to scientific studies, they did not separate med. and the physical sciences from philosophy. In astron., chem., and med. they observed facts, but reached no new laws; their math's was rendered useless by its adoption of Alexandrian metaphysics and Chaldean astrology.

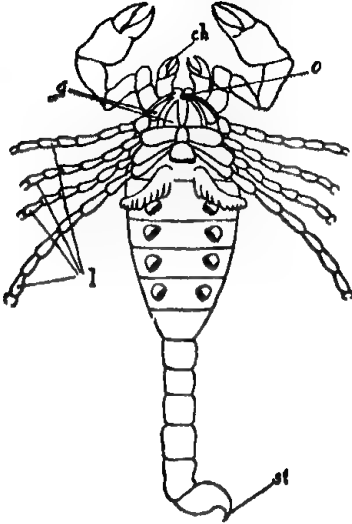
ARACAJÚ (11° 5' S., 37° W.), port, Brazil. Pop. c. 22,000.

ARACATY (4° 30' S., 37° 50' W.), port, Brazil. Pop. 20,200.

ARACHNE (classical myth.), a Lydian weaver who challenged comparison with the work of Athena. The jealous goddess, unable to find any fault, destroyed the work, whereupon A. hanged herself, but was afterwards changed into a spider. The story is related by Ovid.

ARACHNIDA, a heterogeneous class of the phylum Arthropoda, including spiders, mites, scorpions, king-crabs, and trilobites. The anterior segments are usually fused to form a cephalothorax, with six pairs of appendages, of which the first two are modified for seizing food, and the others contain excretory (coxal) glands. Many forms are provided

with an internal plate-like skeleton, the endosternite. An elongated heart is found in the dorsal side of the abdomen. The sexes are separate, and the young generally resemble the adults. The following classification gives an outline of the characters of the different orders: (1) *Scorpionidea*, animals with an elongated abdomen bearing a spine with a poison gland at the tip. The first appendages are shaped



A SCORPION AS AN EXAMPLE OF ARACHNIDA VIEWED FROM BELOW. *ca*, chelicerae; *g*, chewing processes borne at the bases of *l*, the walking legs; *o*, mouth; *st*, sting, at tip of post-anal piece.

somewhat like the claws of a lobster, with which they seize their prey. The latter (small animals) are stung, and the blood and juices sucked out. The scorpions breathe by means of 'lung-books,' which have been regarded as being either modified tracheae (respiratory tubes) or modified gills. They live in warm countries, hiding during daytime, but very active at night. The 'book-scorpions' and the long-legged 'harvestmen' (not to be confused with the harvest-bugs) eat minute insects and occur in northern countries, and are referred to orders distinct from the true scorpions. Scorpions have been found in Silurian and Carboniferous strata.

(2) *Araneida* or spiders are very widely distributed, and have very complex habits. Their body, consisting of a cephalothorax and abdomen connected by a narrow waist, is covered by a chitinous cuticle which is moulted during growth. The first appendages are modified as venomous fangs, while the second ones help in mastication, and, in the males, are used as copulatory organs. The senses are well developed, especially the touch, and vision by means of two or three rows of simple eyes. They breathe through complicated lung-books. Many spiders are provided with 'spinnerets,' organs secreting a kind of silk, which are under the control of the spinner. The threads are used for making traps to ensnare insects, for lining the often ingeniously constructed nests, for egg-cocoons, and for climbing purposes. Courtship is complicated, and the males are often brilliantly coloured to attract the females. The common garden spider, the house spider, the large tropical mygalé (which can kill small birds), the jumping spiders, and the aquatic *Agyroneta* are well-known types. (3) *Acarina*, mites and ticks, are generally unsegmented, the abdomen being fused with the cephalothorax. They are frequently parasitic, e.g. the itch-mite, follicle-mite, harvest-mites, and ticks. The cheese-mites, water-

mites, and the red spider are also well-known members of this order.

(4) *Xiphosura* are represented by the king-crab *Limulus*, with a horseshoe-shaped cephalothorax, and abdomen ending in a long spine, and live in shallow water off the Atlantic shores of N. America, the West Indies, and Eastern Asia. (5) *Eurypterina* are extinct marine animals found in Ordovician to Carboniferous formations, some attaining a length of over 5 feet. (6) The *Trilobita* are compact extinct forms, which flourished chiefly in Cambrian times. The last three orders may be united into a class, *Palaeostraca*. The aberrant *Pentastomida*, the *Tardigrada* (sloth-animalcules or water-bears), and the *Pycnogonida* (sea-spiders), which climb about hydroids and seaweed, are also included in the class *Arachnida*.

R. I. Pocock, *Arachnida of British India* (London, 1900); Ellis, *Spiderland* (1912); C. Koch, *Die Arachniden*, 16 vols. (Nürnberg, 1831-48).

ARAD and New ARAD (46° 13' N., 21° 17' E.), town, Hungary. Pop. (1910) 63,166.

ARAF, **AL** (Arab.), region vaguely described in *Koran*, and variously interpreted by Muhammadans as Limbo or Purgatory.

ARAFAT, **MOUNT**, hill, near Mecca, visited by Muslim pilgrims.

ARAFURA SEA (10° 50' N., 132° E.), sea between New Guinea and Australia.

ARAGO, **DOMINIQUE FRANÇOIS JEAN** (1786-1853), Fr. physicist; app. when nineteen, sec. at Paris Observatory; through Laplace's influence became Biot's assistant for meridional measurements. In the Balearic Islands he was imprisoned as a spy, escaped, and, after adventures in N. Africa, returned to France. App. prof. of Analytical Geometry and astronomer of the Paris Observatory at the age of twenty-three, he became famous for his astronomical lectures. With Gay-Lussac he founded the *Annales de chimie et de physique*; for his researches on rotary magnetism he received the Royal Society's Copley Medal, 1825; he further investigated polarisation of light, and made numerous other important discoveries in optics and magnetism. A. was a member of the Provisional Government, 1848; his political activity was of great value to Fr. science.

Arago's *Œuvres*, 17 vols. (1854-62); Rev. Baden Powell trans. of his *Autobiography* (London, 1858).

ARAGON (41° 50' N., 0° 30' W.), ancient kingdom, Spain, dating from XI. cent.; capital, Saragossa; united with Castile in 1479; now forms provinces of Huesca, Zaragoza, Teruel; area, 18,294 sq. miles; surface is hill-encircled plain, watered by Ebro. Pop. (1911) 950,633. See **SPAIN**.

ARAGONITE (CaCO_3), mineral, discovered in Spain; orthorhombic crystals usually twinned, calcite being its stable dimorph. Fibrous a. is termed satin spar.

ARAGUA (9° 25' N., 64° 55' W.), state, Venezuela. Pop. c. 95,000.

ARAGUAYA (8° S., 50° 30' W.), river, Brazil; joins Tocantins.

ARAKAN (21° 6' N., 92° 50' E.), province, Lower Burma; Brit. since 1826; capital, Akyab; chief river, Koladaing; rice, timber, salt, coal, iron. Pop. 762,102.

ARAKCHEEV, **ALEXSEI ANDREEVICH**, **COUNT** (1769-1834), Russ. general; entered army (1788); being a capable artillery officer, he won rapid promotion; cr. baron (1797); subsequently colonel of whole Preobrazhenski Guard; count (1799); inspector-general of artillery (1803); war-minister (1808); counsellor and senator (1810). A. reorganised the army, and was a stern disciplinarian and energetic conscientious administrator.

ARAL (45° N., 60° E.), second largest inland sea, W. Asia; water slightly saline; present area, c. 26,230 sq. miles, but is diminishing; receives waters of Amu-Darya and Sir-Darya; has innumerable islets

on E. side, larger ones farther N.; surrounded by desert lands; contains sturgeon, etc.

ARAM, EUGENE (1704-59), Eng. schoolmaster and murderer; b. Ramsgill (York); was self-educated, but acquired considerable learning, and was a schoolmaster at Netherdale, Knaresborough, and Lynn (Norfolk); was the first scholar to draw attention to the affinity existing between the Celtic and other Indo-European languages. He was found guilty of the murder, thirteen years earlier, of Daniel Clark, whose body he hid in a cave at Knaresborough. He eventually confessed his guilt, asserting that Clark had been intimate with his wife, and was hanged at York, after having attempted to commit suicide; subject of novel by Bulwer Lytton, and poem by Thomas Hood.

ARAMAIC, Semitic language, or dialect, anciently spoken in Syria and Mesopotamia. It was employed, amongst others, by the Samaritans, and is believed to have been the language spoken in Palestine during the time of Christ.

ARAN ISLANDS (53° 6' N., 9° 44' W.), islands, W. Irish coast.

ARANDA, PEDRO PABLO ABARCA DE BOLEA, COUNT DE (1718-90), Span. general and statesman; built up Span. navy; procured expulsion of Jesuits; succ. in supreme power (1774) by Florida Blanca; was subsequently ambassador in Paris till 1787.

ARANEIDÆ, see ARACHNIDA.

ARANJUEZ (40° 2' N., 3° 38' W.), town, Spain; ancient royal palace. Pop. 12,670.

ARANY, JÁNOS (1817-82), Hungarian poet; in his early years he led an unsettled life, and was for some time an actor. He first made his mark as a poet with a satirical poem, *The Lost Constitution* (1845). He is perhaps best known as the author of an epic trilogy, *Toldi* (1847), *Toldi's Evening* (1854), *Toldi's Love* (1879). Other poems by him are: *The Conquest of Murany*, *The Death of Buda*, and *The Gypsies of Eida*. He also trans. several plays of Shakespeare, and the *Comedies of Aristophanes*. A. was one of the greatest of Hungarian poets, giving a character and nobility to its lit. which were previously wanting.

ARAPAHO, N. Amer. Indians now found in Oklahoma and Wyoming.

ARAPILES, LOS (40° 56' N., 5° 37' W.), small Span. town in province of Salamanca. Pop. 557; scene of victory of Wellington in Peninsular War, July 22, 1812.

ARARAT (39° 40' N., 44° 15' E.), mountain, Armenia, traditionally connected with Noah's Ark; consists of double volcanic peak, Great and Little A., respectively c. 17,000 and c. 13,000 ft. above sea-level; also called Mt. Massis; snow-line about 14,000 ft. above sea-level; first ascended in 1829.

ARARAT (37° 17' S., 142° 54' E.), town, Victoria. Pop. 3580.

ARAROA POWDER, GOA POWDER, obtained from trunk of a tree (*Andira Araroba*) chiefly growing in province of Bahia, Brazil; powerful irritant and weak parasiticide.

ARAS (40° 5' N., 43° E.), river, Asiatic Turkey and Russ. Armenia.

ARASSUAHY (16° 45' S., 41° 40' W.), town, Minas Geraes, Brazil. Pop. 44,000.

ARATUS (315-245 B.C.), Gk. poet and astronomer; contemporary of Theophrastus, whose poems have been trans. by Cicero and others; A. is quoted in *Acts* xvii. 28.

ARATUS OF SICYON (271-213 B.C.), Gk. general and statesman; promoted Achaean League.

ARAUCANIA (38° 45' S., 73° 5' W.), territory, Chile, S. America. Araucanians, S. Amer. Indians living in Chile; of fine physique and considerable intelligence, nomadic habits, and warlike spirit, they offered fierce resistance to early Span. invaders.

ARAUCARIA, genus of evergreen Coniferae, native of S. America and Australia—*A. imbricata*, 'monkey-puzzle,' grows in Britain.

ARAUCO (38° S., 73° 10' W.), province, Chile. Pop. (1910) 62,260.

ARAUJO E AZEVEDO, ANTONIO DE (1754-1817), Count of Baroa, Portug. statesman and diplomatist; on Fr. invasion (1808) assisted in royal flight to Brazil.

ARAUJO PORTO ALEGRE, MANOEL DE (1806-79), Brazilian poet who wrote on national themes, *Colombo*, *Brasílianas*, etc.

ARAVALLI HILLS (24° to 27° N., 72° to 75° E.), mountains from Gujarat through Rajputana and Ajmere Merwara, India; highest peak, Mt. Abu.

ARAWAK, S. Amer. Indians living in Guiana.

ARBACES.—(1) Mythical prince who defeated Sardanapalus (q.v.) and established Median empire. (2) General in army of Artaxerxes Memnon, 401 B.C. (3) Hero of Beaumont and Fletcher's *King and No King*.

ARBALIST, ARBALIST (from Late Lat. *arcuballista*), weapon of mediæval warfare which combined form and functions of cross-bow and gun.

ARBE (44° 48' N., 14° 45' E.), Austrian island, Adriatic. Pop. 4441.

ARBELA, ARBIL (36° 10' N., 44° 20' E.), town, Assyria; here Alexander the Great finally defeated Darius, 331 B.C. Pop. c. 4000.

ARBER, EDWARD (1836-1912), Eng. scholar; Fellow of King's Coll., London; D.Litt. (Oxon); F.S.A.; editor of *An English Garner* (1880-83), and numerous other reprints of rare books.

ARBITRAGE, term used for a traffic in stocks and shares by which a dealer buys in a relatively cheap market and sells in a dearer; also judgment by an arbitrator, but in this sense it is now practically obsolete.

ARBITRATION, a method of settling civil disputes without litigation; governed by the Eng. Arbitration Act (1889). By this Act disputants may arrange to submit matters of difference to the decision of one or two arbitrators, a custom which is increasing in popularity amongst trading concerns. The Arbitration (Scotland) Act (1894) differs in some of its details from the Eng. Act.

International A., the settlement of differences between independent countries by referring the matter in dispute to selected persons, who pronounce judgment after hearing the evidence tendered by both sides, it being understood that the award must be in accordance with international law. Many efforts have been made to establish permanent arbitration courts, and in 1873 a motion was carried in the House of Commons that the Powers should be urged to agree to such an arrangement. On the suggestion of the Tsar a peace conference was held at The Hague, in 1899, to which nineteen States sent delegates, and an international tribunal, known as 'The Hague Court,' was agreed to. Each State signing the convention had the power of nominating four persons of eminence in international law, who were willing to serve as arbitrators. In Oct. 1903 the Fr. Ambassador and Lord Lansdowne (Foreign Sec.) signed an agreement that questions of a judicial character, or relating to the interpretation of treaties, arising between Great Britain and France, should be referred to the Hague Court. That tribunal met on Nov. 13, 1903, to consider matters in dispute between Venezuela on the one hand and Britain and other European powers on the other. There is a growing tendency in favour of referring international disputes to arbitration, as is shown by the fact that, during the three years ending 1903, more than fifty cases were so referred. Later disputes thus settled have been between Great Britain, France, and Germany on the one hand, and Japan on the other, with regard to a certain tax levied by the latter power (1904-5); and at a little later date a delicate matter was settled with regard to the French flying their flags in the Red Sea and upon the littoral of S.E. Arabia. During the year 1911, arbitration treaties were drawn up between Britain and the U.S.A., and between the latter country and France. See PEACE MOVEMENT.

Industrial A., method of arriving at an amicable settlement between employers and employees, or other disputing parties. If the disputants seriously agree to settlement by a third party, the method is known as 'arbitration.' If, however, no such agreement is come to, the work of the mediator who endeavours to bring about an amicable settlement is described as 'conciliation.' By the Brit. Conciliation Act (1896) Conciliation Boards may be established, and registered with the Board of Trade, for the purpose of settling disputes between employers and workmen by conciliation or arbitration. Where differences exist, or are apprehended, the Board of Trade has power to inquire into the circumstances and to take steps for bringing together the representatives of either party with a view to an amicable settlement. Moreover, if either party desires it, the Board of Trade may appoint a Conciliation Board; and if both parties desire it, an arbitrator may be appointed. New Zealand Industrial Conciliation and A. Act (1894) makes the award of the Court of A. compulsory; New S. Wales and W. Australia have copied New Zealand legislation. Australian Commonwealth passed compulsory a. law, 1904, to deal with disputes of more than one stato. Brit. Trade Unionists are in the main opposed to compulsion.

Russell, *On Arbitration and Award* (1906); Darby, *International Tribunals* (1904); Knoop, *Industrial Conciliation and Arbitration* (1905); Jeans, *Conciliation and Arbitration in Labour Disputes*.

ARBLAY, D', see D'ARBLAY.

ARBOGA (59° 24' N., 15° 50' E.), town, Sweden. Pop. 6254.

ARBOGAST (IV. cent.), Rom. barbarian general.

ARBOGAST, LOUIS FRANÇOIS ANTOINE (1759-1803), Fr. mathematician.

ARBOIS (46° 54' N., 5° 46' E.), town, Jura, France; wines. Pop. 4210.

ARBOIS DE JUBAINVILLE, MARIE HENRI D' (1827-1910), Fr. historian and philologist; was prof. of Celtic in the Collège de France; author of *Introduction à l'Étude de la littérature celtique* (1883), *L'Épopée celtique en Islande* (1892), *Études sur le droit celtique* (1895), etc.

ARBOR DAY, day app. for the public planting of trees for encouragement of forestry in U.S.A., and observed as a holiday. The date varies in different States.

ARBOR VITÆ, tree-like appearance of vertical section through cerebellum (anat.); tree of genus *Thuja* (bot.).

ARBORETUM, a place set apart for the scientific cultivation of trees and shrubs. See BOTANIC GARDENS.

ARBORICULTURE, the science and art of cultivating trees. See FORESTRY.

ARBROATH, ABERBROTHOCK (56° 33' N., 2° 35' W.), seaport, Forfarshire, Scotland; linen manufacture, sailcloth, leather, bleach-fields; tidal harbour; shipbuilding works; ruined abbey. Pop. (1911) 20,600.

ARBUES, PEDRO DE, ST. (1441?-85), Span. inquisitor; app. first inquisitor for Aragon, 1484; zeal led to his murder; canonised, 1661 and 1867.

ARBUTHNOT, ALEXANDER (1538-83), Scot. poet and ecclesiastic.

ARBUTHNOT, JOHN (1667-1735), Scot. physician and humorist; F.R.S.; friend of Swift, Pope, Gay, and others; physician to Queen Anne; author of *History of John Bull and Memoirs of Martinus Scriblerus*; also *An Argument for Divine Providence* (1710), *Effects of Air on Human Bodies* (1733), *Nature of Ailments, Table of Ancient Coins*, and other works.

ARBUTUS, genus of shrubs and trees of the order Ericaceæ, occurring in S. Europe, Asia, and America. *A. unedo*, the strawberry tree, grows near the Lakes of Killarney, cultivated in Britain as an ornamental evergreen. *A. Menziesii*, the Madroña, grows to 100 ft. high in California.

ARC, part of circumference of circle or other regular curve; part of apparent path of heavenly

body; curved flame between two electrodes through which current is passed—*electric a.*

ARC, JEANNE D', see JOAN OF ARC.

ARCACHON (44° 40' N., 1° 12' W.), port and health resort, Gironde, France; famed for oysters. Pop. 9000.

ARCADE, a series of arches supported by columns or piers, such as may be seen in the Ducal Palace at Venice; where they appear as relief work against a wall they are termed 'blind arcades,' many examples of which are to be seen in the older Eng. cathedrals; the term is also used in modern times for a covered avenue between buildings, such as the Burlington Arcade, London.

ARCADELT, JACOB (1514-60), musical composer of Netherlands; famous singer and author of masses, madrigals, etc.

ARCADIA (37° 34' N., 22° 13' E.), department, Greece. Shut off by mountains, A. did not share in the civilisation of Greece. Inhabitants, a pastoral people mainly, were lovers of music and dancing; hence poetic ideal of A. Pop. 162,000.

ARCADIUS (378-408), Byzantine emperor; s. of Rom. emperor Theodosius, on whose death (395) the empire was divided between A. and his bro. Honorius. A. governed the eastern prefectures; his reign was marked by Alaric's invasion of Gk. peninsula (395-96), and exile of Chrysostom, Constantinopolitan patriarch (404); he was a weak, incompetent emperor.

ARCADIUS (II. cent. A.D.), Gk. grammarian; author of works on syntax and orthography.

ARCANUM (Late Lat. secret place), term in alchemy for the great secret of nature, the *elixir vite*, and afterwards for secrets of quack doctors, etc.

ARCESILAUS (316-241 A.C.), Gk. philosopher, founder of the New Academy, who, in opposition to Stoics, held we have no criterion of truth, and denounced dogmatism.

ARCEVIA (43° 31' N., 12° 56' E.), town, Ancona, Italy.

ARCH, the name usually given to the section of a building spanning an opening, or passage, usually curved, and composed of wedge-shaped blocks of stone, or bricks. An a. may be round, pointed, trefoil, or varieties of these shapes. A's are distin-



SAXON ARCH.



NORMAN ARCH.



EARLY ENGLISH (LANCET) ARCH.



DECORATED ARCH.

guished in architecture by the distinct styles to which they belong; thus all Norman or Romanesque a's are round, the earlier ones plain, while a later development

added the familiar zigzag decoration known as 'dog-tooth.' The Norman style was followed by the Gothic, which was pointed, and embraces Early English, Decorated, Perpendicular, and Tudor, covering the historic period from about the end of the XII.



PERPENDICULAR ARCH.



TUDOR ARCH.

cent. to the middle of the XVI. A's have also been built to stand by themselves as triumphal monuments, particularly by the ancients. Surviving examples of this kind are the Arch of Titus (80 A.D.); the Arch of Septimius Severus (203 A.D.); and the Arch of Constantine (312 A.D.), all at Rome. Others at Ancona, Orange, St. Rémy, and elsewhere in Italy and S. France. The Arc de Triomphe de l'Etoile, in Paris, completed in 1836, may be cited as a modern example.

ARCH, JOSEPH (1826–), Eng. politician; a. of an agricultural labourer in Warwickshire; self-educated; founded National Agricultural Union (1872).

ARCHÆOLOGY, the study of antiquities, which includes the art and architecture, and the customs, manners, and beliefs of early peoples, such as may reasonably be deduced from ancient monuments, and remains discovered in tombs, caves, river-drift, etc. A. was formerly taken as differing from history, which relies chiefly upon authenticated documents and recorded dates, while a. seeks to make out a connected story of man's development upon earth by a comparison of objects found in one country, under certain geological conditions, with similar objects found in another country. But the historian of to-day, in treating of the periods covered by a., makes use of its material and conclusions, whence a. has become, strictly, a department of history.

The science of a. is associated, to a certain extent, with the study of geology, philology, and anthropology. Though first applied only to the antiquities of Greece and Rome, the term is now generally understood to refer to the entire range of human development, from the prehistoric period down to the Middle Ages.

The study of a. may hardly be said to have been taken up systematically before the XIX. cent., and it was the Scandinavians who then attempted to reduce the study to an exact science by classifying the different periods of man's development, and attempting the fixing of their dates. Hereunder is given the classification arrived at by the Dan. archaeologist Worsaae: (1) the Early Stone, or Palæolithic Age, dating back to about 3000 B.C.; (2) the Later Stone, or Neolithic Age (2000 to 1000 B.C.); (3) the Early Bronze Age (1000 to 500 B.C.); (4) the Later Bronze Age (500 B.C. to birth of Christ); (5) the Early Iron Age (1 to 450 A.D.); (6) Middle Iron Age (450 to 700 A.D.); (7) the Late Iron or Viking Age (VIII. to XI. cent.).

These can only be taken as extremely broad, and by many geologists (whose proper science is the study of the earth's ages) much-controverted conclusions. The assumption deduced from this system of study is that mankind has progressed from a state of savagery to various degrees of culture. This is shown by the domestic implements and weapons used at different periods. Thus it is supposed that wood, bone, or horn were the first substances employed by primitive man for domestic or warlike purposes; these, from their nature, have mostly perished; then came the use of flint, from which were fashioned rude axes, hammers, spear-

heads, arrow-heads, knives, etc., which in later developments began to assume more artistic shapes, and were polished and otherwise decorated; then, in due course, followed the use of bronze and iron, as indicated in the foregoing table. It should be borne in mind, however, in using the above definitions that the term 'Age,' as applied to a., cannot be held to cover any definite period of time, inasmuch as the Early Bronze Age in one country may be contemporaneous with the Stone Age of another. It may be noted that in Scandinavia, and in Scotland, no evidence of man's occupation is yet forthcoming of an earlier period than the Neolithic Age. In dealing with so vast a subject as a. it is not possible here to do more than indicate the main lines of study to be followed, but many of its branches have been dealt with under their several heads. Since the establishment of the London Society of Antiquaries in 1751, and that of Scotland twenty-nine years later, the study of a. has spread rapidly, and flourishing societies of like kind are to be found in most provincial centres; while chairs and lectureships in a. exist at the leading Brit. universities.

Layard's *Nineveh* (1849); Wilkinson's *Ancient Egyptians* (1878); works by Prof. Flinders Petrie; Murray's *Greek Archaeology* (1892); Smith's *Greek and Roman Antiquities* (1890); Lubbock's *Origin of Civilisation* (6th ed., 1902), and *Pre-Historic Times* (6th ed., 1900); Lyell's *Antiquity of Man* (4th ed., 1873); Tylor's *Primitive Culture* (4th ed., 1903); Dawkins's *Cave-Hunting* (1874), and *Early Man in Britain* (1880); Fergusson's *Rude Stone Monuments* (1872); Koller's *Lake Dwellings* (1878); Munro's *Lake Dwellings* (1890); Worsaae's *Pre-History of the North* (Eng. trans. 1887); Lowrie, *Christian Art and Archaeology* (1901).

ARCHÆOPTERYX, extinct primitive bird, about the size of a crow, two specimens of which have been discovered in the Jurassic (Upper Oolitic) lithographic slates near Solenhofen (Bavaria). Although the possession of well-developed feathers, probably a keeled breast-bone, of wings, and a bird-like skull characterise a. as a distinct bird, the long tail, the structure of the hand skeleton, and the possession of teeth held in separate sockets, must link it with the reptiles.

ARCHAISM, the use of old or obsolete words or idioms; also an instance of such usage.

ARCHANGEL, ARKANGELSK (64° 32' N., 40° 33' E.).—(1) Cathedral town and seaport on Dwina, Russia; trading centre. Pop. 35,000. (2) Government, Russia; area, 326,063 sq. miles; timber. Pop. (1910) 437,800.

ARCHANGELS, spiritual beings of the first order, referred to in Bible and Koran. According to the latter there are four: Gabriel, the recorder; Michael, Christ's champion; Azrael, the angel of death; and Azrafil, who will blow the trumpet at the resurrection.

ARCHBALD (41° 30' N., 75° 35' W.), borough, Pennsylvania, U.S.A. Pop. (1910) 7194.

ARCHBISHOP, a chief bp., or the bp. of a province, as well as of his own (arch) diocese; title usually implies metropolitan functions. First recorded use of the title (to denote respect) is by St. Athanasius in IV. cent. Certain Oriental Churches, some branches of Lutheran Church, R.C., and Anglican Churches still use the title, but the powers and functions associated with the title vary. The a.'s of Canterbury ('Primate of All England') and York ('Primate of England') share ecclesiastical government of Church of England; in some matters the former has jurisdiction in province of York; both a.'s by virtue of their office are ecclesiastical commissioners for England; their special symbol of office is the processional cross, borne immediately in front of them. R.C. a.'s wear the pallium.—**Archbishops' Court**, see **ECCLIASTICAL COURTS**.

ARCHDEACON, official in Christian Church since IV. (possibly III.) cent. At first the a. was chief

of deacons, and assisted bp. in various ways, e.g. helping poor and in services of church. A.'s power increased till XIII. cent., when it declined; now in R.C. Church only nominal. In Anglican Church a's have important functions, holding visitations of clergy, etc.

ARCHDUKE, title borne by members of the imperial house of Austria; was first formally conferred by the Emperor Frederick III., in 1453, upon his s. Maximilian.

ARCHEAN SYSTEM, or **PRE-CAMBRIAN**, the oldest rocks known, of world-wide distribution and varied composition, but consisting chiefly of gneisses and metamorphic schists of enormous thickness. Owing to manifold mechanical deformations, subdivisions of the system are difficult to outline, and the occurrence of fossils is extremely rare, so that formerly the term *azoic* (without animal life) was applied to the rocks. These are frequently altered, owing to regional metamorphism, or mingled with sedimentary and volcanic beds, and penetrated by valuable mineral veins. The Lewisian igneous gneissose formation of N.W. Scotland, corresponding to Laurentian in Canada, and the Dalradian schistose series of Scotland and Scandinavia, corresponding to N. American Huronian, and the Torridonian (Scot.) and Sparagmite (Norway) beds or Keweenaw beds (N. American) are principal subdivisions.

ARCHEGONIATE, name given to Bryophyta (q.v.) and Pteridophyta (q.v.) because they possess Antheridium and—

ARCHEGONIUM, flask-like female organ, with walls of only one layer of cells; analogue of pistil.

ARCHELAUS, king of Judaea during rule of Augustus; notorious for cruelty.

ARCHELAUS (413–399 B.C.), king of Macedon; protected the exiled Euripides.

ARCHELAUS OF CAPPADOCIA, famous general under Mithradates the Great.

ARCHELAUS OF MILETUS (V. cent. B.C.), Gk. philosopher; pupil of Anaxagoras; devoted to the study of cosmology; originated the theory of the earth's spherical form.

ARCHENHOLZ, JOHANN WILHELM VON (1743–1812), Ger. historian; achieved considerable popularity with his *Geschichte des Sieben Jährigen Krieges* (1793); author also of *England und Italien*, and other works.

ARCHER, WILLIAM (1856–), Scot. dramatic critic and translator; dramatic critic of the *Figaro*, the *World*, the *Tribune*, and now of the *Nation*; trans. dramas of Ibsen; and has besides pub. *English Dramatists of To-day* (1882), *Poets of the Younger Generation* (1901), *Play-Making* (1912), etc.

ARCHERY, the art of shooting with the bow and arrow; has been practised since very ancient times, records and inscriptions proving its existence among the Egyptians, the Israelites, the Assyrians, and the Greeks, while savage tribes are found to-day still using the bow in hunting and in fighting. Perhaps the art was brought to greatest perfection in England in the time of Edward III., and the great victories of Crécy, Poitiers, and Agincourt were won mainly by the skill of Eng. bowmen. The introduction of fire-arms and artillery naturally led to the decline of a., but as late as the battle of Duns Law (1639), the Scot. Highlanders used the bow in warfare.

As a sport, a. continued to exist to a certain extent after it had ceased to be a serious method of attack in war, and at present quite a number of clubs and societies are flourishing. The oldest is the Scot. Royal Company of Archers, which is the King's Body-Guard for Scotland, and consists of Scot. noblemen and other Scotsmen of distinction. Its records date back to 1676, but it was in existence before that time, while many ancient prizes are still competed for by its members every year. In England the chief societies are the Royal Toxophilite Society, founded 1781; the Woodmen of Arden, founded 1785; and the Grand

National Archery Society, founded 1861, which holds championship meetings and is the ruling body in England.

Shooting ordinarily is practised at targets 4 ft. in diameter at from 50 to 100 yds. apart, although the Royal Company of Archers shoots at targets 3 ft. in diameter, 180 yds. or more apart; the target has a gold spot in the centre, surrounded by circles of different colours. A bow is usually about 6 ft. long, its strength being calculated on the weight required to draw a full-sized arrow to its head—the ordinary drawing-power being 40 to 60 lb. An arrow is 27 to 30 in. long, the weight, calculated in new Eng. silver, being about equal to four-and-sixpence.

Roberts' *English Bowman*, 1801; Hansard's *Book of Archery*, 1840; Longman and Walrond's *Archery* (Badminton Library).

ARCHES, COURT OF, see **ECCLÉSIASTICAL COURTS**.

ARCHESTRATUS OF SYRACUSE (fl. 330 B.C.), Gk. poet; wrote a poem on gastronomy, some portion of which is preserved in Athenæus.

ARCHIAC, DESMIER DE SAINT SIMON, VICOMTE D' (1802–68), Fr. geologist and palæontologist; author of numerous research memoirs.

ARCHIAS (murdered 478 B.C.), tyrant of Thebes; warned of plot against him in letter, which he rejected with words, 'Business to-morrow.'

ARCHIAS, AULUS LICINIUS (b. 120 B.C.), Gk. poet, who was patronised by Lucullus; many of his epigrams find a place in the Gk. Anthology.

ARCHIDÆ, species of shell-fish with binged equivalvular shell.

ARCHIDAMUS, name of five Spartan kings (Eurypontids), of whom the most famous was **ARCHIDAMUS II.** (476–427), who played a prominent part at beginning of Peloponnesian War.

ARCHIDONA.—(1) (37° 8' N., 4° 23' W.) town, Malaga, Spain. Pop. c. 8000. (2) (0° 45' S., 76° 50' W.) town, Ecuador.

ARCHIL, purple dye for woollens and silks, extracted from lichens, 'orotile' in Scotland.

ARCHILOCHUS (VII. cent. B.C.), Gk. poet; wrote elegies, hymns, and lampoons, and was the inventor of iambic verse. Horace is said to have been largely influenced by his metres.

ARCHIMANDRITE, title of Abbot-Extraordinary in Gk. Church.

ARCHIMEDES (c. 287–212 B.C.), Gk. mathematician; b. Syracuse; studied in Alexandria; returned to native city; accidentally killed after its capture by Romans under Marcellus. Besides being most eminent mathematician of antiquity, he founded the science of hydrostatics, invented engines of war, the water-screw, and numerous other mechanical contrivances.—The Archimedean Principle is that a body immersed in a liquid loses weight by an amount exactly equal to that of the liquid displaced. A. discovered this when taking a bath, and in his excitement rushed naked into the streets, crying '*Eureka! Eureka!* I have found it! I have found it!'—The Screw of A., spiral screw revolving inside watertight cylinder for raising water to higher level.

Plutarch, *Life of Marcellus*; T. L. Heath, *The Works of Archimedes* (Cambridge, 1897).

ARCHIPELAGO, any sea studded with islands; among best examples, Gk. A. and Malay A.

ARCHIPPUS (V. cent. B.C.), Gk. comic poet; wrote several comedies, the most famous of which was the *Fishes*.

ARCHITECTURE, the art of building; the planning of a structure and its harmonious arrangement and ornamentation according to definite principles, as a work of beauty or grandeur. The beginning of the art is found in the efforts of primitive man to provide shelter for himself, different modes of building being adopted according to the requirements and customs of the people and the climate of the country. The most elaborate buildings of different countries and

different periods may all be traced to the two important materials for building in early times, wood and stone, and on the methods naturally adopted for construction in those two materials all the principles of a. are founded. In building with wood, the main principle consists in having vertical pillars with beams laid across them, which is called the *trabeate* system; while in building with stone the underlying principle is the arch and its supports.

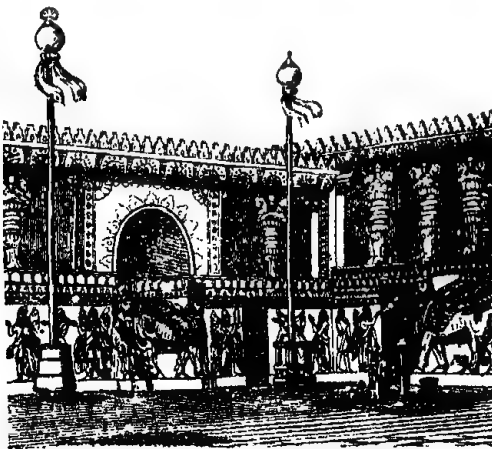
Egyptian Architecture.—It is in Egypt that the most ancient records of a. are found, well-known examples being the Pyramids at Ghizeh, near Cairo, dating from 3900 to 3700 B.C., of which the largest, commonly known as the Great Pyramid of Cheops, covers 13 acres. At Beni Hasan there are rock-cut tombs which have fluted columns supporting or appearing to support the overhanging rock, dating from about 2200 B.C. These are the earliest examples of a type of a. which influenced that of Greece and subsequently of all Europe. From 1700 to 1300 B.C.



SECTION OF CENTRAL PART OF HYPOSTYLE HALL AT KARNAK.

most of the noblest buildings in Egypt were built, among them the great temple at Karnak, the Hypostyle Hall of which (measuring 340 by 170 ft., and containing 134 columns in sixteen rows) is considered the most beautiful and imposing structure of its kind in the world. From this period also date the great temple at Luxor and the many great buildings of Memphis, Heliopolis, and Thebes. For 1000 years after this a. declined, reviving then for a time under the Ptolemies, the temple of Isis at Philæ being a beautiful example of this period.

Assyrian Architecture.—About 800 B.C., 1200 years

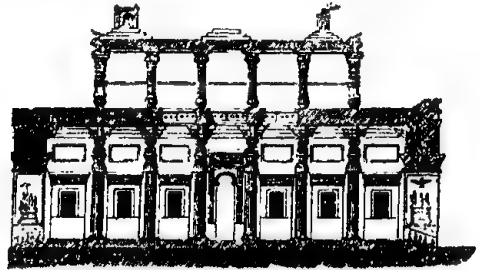


RESTORATION OF ANGLE OF PALACE COURT, KHORSABAD.

after Nineveh was founded, the Assyrians commenced a period during which many magnificent buildings

were erected. The use of the arch was known to them, but the column was not much employed. Some of the oldest buildings resemble the Pyramids of Egypt, but they were temples, not tombs; while excavations carried out at Nineveh, Nimrud, and elsewhere have revealed the sites of magnificent palaces, the great gateway of Khorsabad, with its massive human-headed winged bulls, parts of which are now in the Brit. Museum, being a well-known example of the style of this period.

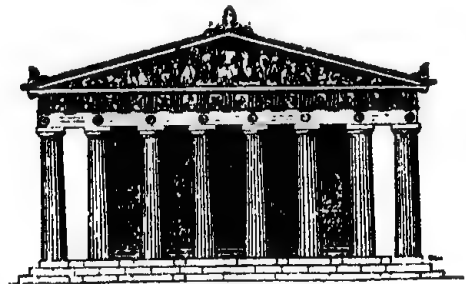
Persian Architecture.—Persian a. was derived to a great extent from that of the Assyrians. Under Darius and Xerxes (c. 500 B.C.) they surpassed even the Assyrians in the magnificence of their palaces, and, using marble where the Assyrians used wood and brick, these have been better preserved. The



RESTORED SECTION OF HALL OF XERXES.

palaces at Persepolis are the finest examples of their work, the Hall of Xerxes, extending to twice the area of the great Hypostyle Hall of Karnak, being one of the greatest buildings of ancient times. The Ionic and probably the Corinthian capital were developed by the Greeks from Persian decoration.

Greek Architecture.—Gk. a. was an original development, as recent discoveries at Crete have proved, although it was influenced in many ways by Egypt and Assyria. An advanced state of civilisation existed in Crete about 3000 B.C., when great palaces were built; but this older civilisation was swept away by invaders from the north about 1100 B.C., and the oldest Gk. temples, the remains of which have been discovered, date from shortly after this time. The culminating period of Gk. a. was at Athens from

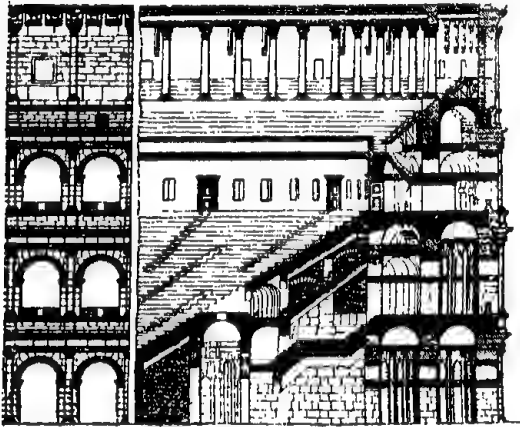
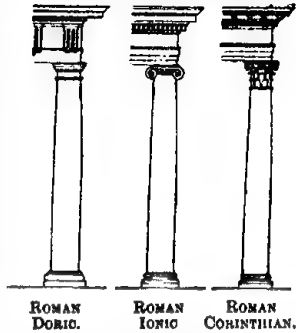


THE PARTHENON.

460 to 400 B.C. There are three styles of classic Gk. a., each of which is denoted by its particular form of column: the *Doric*, strong and simple; the *Ionic*, graceful and more ornate; and the *Corinthian*, with elaborate detail. The Greeks built their temples with the columns arranged outside with a view to external effect. The finest example of Gk. a. still extant is the Parthenon at Athens, built in the Doric style; but it was probably surpassed by the great Ionic temple of Diana at Ephesus, included by the ancients among the seven wonders of the world.

Etruscan and Roman Architecture.—The Etruscans, a race of Eastern origin, were in an advanced state of civilisation at the time of the foundation of Rome.

They made much use of the arch, one of the oldest examples in existence being the Cloaca Maxima, constructed about 600 B.C. for the purpose of draining the lower parts of Rome. About 200 B.C. Gk. a. began to influence Rome, and after the capture of Corinth by the Romans in 146 B.C. Gk. architects and sculptors were employed in constructing the buildings of the city. Roman a. was thus developed by the application of the arch of the Etruscans to the Gk. style of a., while vaulting was also employed. At first, buildings were erected in solid stone,



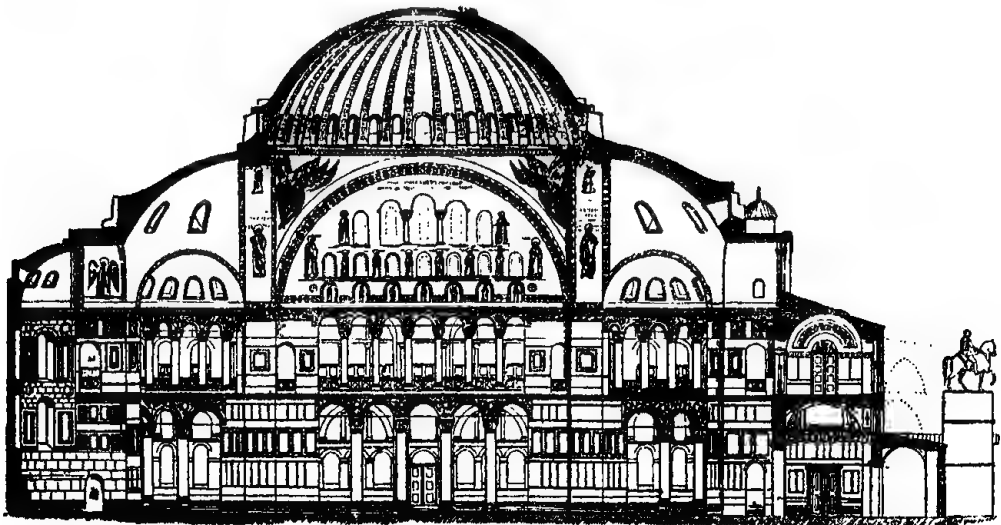
ELEVATION AND PART SECTION OF THE COLOSSEUM.

but in later times problems of a. were solved with concrete, walls and domes being formed of masses of this

modified the Gk. columns and evolved two more orders, the *Tuscan*, a simple Etruscan form resembling the Gk. Doric, and the *Composite*, an attempt to combine the Ionic and Corinthian forms. The Colosseum, a great elliptical circus, built of concrete and stone, and ornamented outside by successive tiers of the different orders of columns, still survives at Rome. The excavations at Pompeii have revealed the Roman domestic a., and at other places in Italy, southern France, and elsewhere in Europe, Asia, and Africa there are interesting remains—Nîmes, in the south of France, for example, having the most perfect existing Roman temple.

Byzantine Architecture.—In the IV. cent. A.D. the Emperor Constantine transferred the seat of the empire to Byzantium or Constantinople, and under him great building enterprises were carried out. The style of a. was adopted from Rome, and the new capital was also much influenced by Oriental decoration. The dome was the characteristic feature of the Byzantine style, and because of this the plan gradually changed from a long rectangle to a square form of building. The Church of St. Sophia at Constantinople, built in 532 to 538 A.D., is the finest example of the Byzantine style, while the most perfect buildings of this character in Italy are St. Mark's, Venice, and St. Vitale at Ravenna. Russian a. is a somewhat debased version of the Byzantine style, which has been adopted in the buildings of the Gk. Church, the oldest examples being the XI. cent. cathedrals at Kiev and Novgorod.

Early Christian Architecture.—It was not until the Emperor Constantine recognised Christianity that the early Christians commenced to erect buildings for the purpose of worship, building them more or less on the plan of the Roman basilicas (halls used for commercial and other purposes), columns, ornaments, and marbles being taken from other buildings for the purpose, or, in some instances, simply making use of the older temples. The earliest Christian building existing now is the Church of St. Paul outside the Walls (Rome), erected in 386 A.D., and carefully restored at the beginning of the XIX. cent. It was built in the form of a square, with a pillared porch, and a semicircular apse opposite the entrance. Transepts were formed later in churches by widening the part of the building farthest from the entrance, in order to provide increased accommodation for the officiating



ELEVATION OF ST. SOPHIA, CONSTANTINOPLE.

material, with false casings, arches, and arcades, of marble, stone, or brick concealing it. The Romans

clergy, a plan which subsequently developed into the typical plan of the mediæval cathedral.

The churches, tombs, and other buildings built by the early Christians in Syria from about 400 to 600 A.D., e.g. the churches at Kalat-Semen and Kalb-Lauzeh, resemble the basilica type rather than the domed Byzantine type of building, although in the details they show Byzantine influence. The earliest Coptic Christian churches in Egypt also show the basilica plan, but they were probably of independent origin.

Romanesque Architecture.—This term is applied in a general sense to the styles developed from Roman a. in Western Europe, through the spread of Christianity. Semicircular arches were substituted for the architraves joining the top of the pillars together, the general design being the same as that of the Roman basilicas.

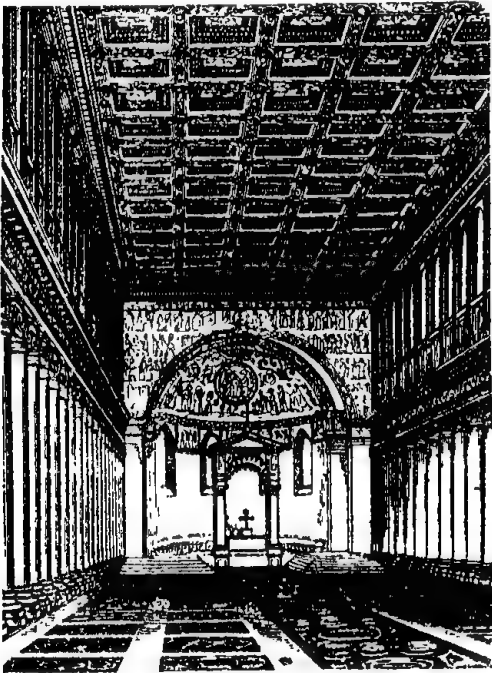
In Italy different styles were in vogue in different parts of the country: in Rome the basilican design of the early Christians still flourished; in northern Italy there was a modification termed the *Lombard* style, the roofs of the churches were vaulted, and substantial piers took the place of the pillars—the churches of St. Ambrogio at Milan and St. Michele at Pavia being built in this manner; while in central Italy the *Tuscan* style, more slender and elegant than the Lombard, prevailed. In southern Italy and in Sicily a. was influenced by the Normans, owing to the Nor-

In Germany Romanesque a. was closely modelled on the northern Ital. style, the cathedral built by Charlemagne at Aix-la-Chapelle about the beginning of the IX. cent. being, however, after the Byzantine design of St. Vitale at Ravenna; and along the Rhine the Romanesque manner reached a high standard of development, the cathedrals at Mainz, Worms, and Speirs being good examples. Features of the Rhenish churches are the square or octagonal turrets, and arcaded galleries decorating the walls.

In England the *Anglo-Saxon* style was evolved by the builders copying the remains of the Roman buildings, and, as they were more accustomed to the use of wood, the earliest Anglo-Saxon buildings were either in wood or were imitations in stone of wooden structures. The nave of Greenstead Church is the only wooden building now existing which probably dates from the Anglo-Saxon period, but the churches at Earl's Barton, Monkwearmouth, and perhaps St. Regulus in St. Andrews are built in stone in this style. Even before the Conquest, Norman a. was making its influence felt in England, through builders, artists, and ecclesiastics coming from abroad. At first the style was almost as plain as the Anglo-Saxon, but we soon find it characterised by rich carving based on geometric forms, zigzags, stars, frets, etc., massive pillars and walls, cubical capitals, the decoration of the wall surfaces with arcades; and the plans show greater length in the choirs, transepts, and naves than was usual in Normandy. Several thousand churches built in the *Norman* style of a. were in existence in England within a cent. of the Conquest. Among the many examples still in existence are Durham Cathedral, Ely Cathedral, the crypt of Canterbury Cathedral; and in Scotland, Kirkwall Cathedral, Kelso and Jedburgh Abbeys.

Gothic Architecture.—Gothic a. was developed from Romanesque as a solution of the difficulty of vaulting, as the semicircular arch was found not to be successful for this purpose unless heavily loaded on the haunches, and owing to the lateral thrust it was necessary to reduce the span. The pointed arch was therefore adopted, first of all in southern France, where it was probably borrowed from the East, and in order to vault oblong spaces ribbed vaulting was carried out, in which a skeleton of ribs going transversely and diagonally across the nave made a framework which was filled in with lighter masonry, and the thrust was brought to bear on separate points, the wall being strengthened at those points by *buttresses*. The thrust being thus borne by the buttresses, the need for massive walls disappeared, so that the spaces between the buttresses began to be filled with great windows, and with the invention of painted glass these windows became one of the chief glories of the Gothic style, the spaces of the windows being divided up, in later times very elaborately, by window-tracery. When aisles were introduced at the sides of the naves the buttresses could not be carried straight down, and flying buttresses, which bridged over the space between the roof of the aisles and the nave, were constructed, and soon became a distinctive feature of the style. The Cathedral of St. Denis is the earliest existing example of Early Gothic a., while soon after its foundation Notre Dame at Paris was begun, together with the great cathedrals at Amiens (the finest example of pure Gothic), Chartres, Rheims, Beauvais, Bourges, and many other places. The principles of the style later developed into the *Flamboyant* style, with great elaboration of detail and profusion of ornament, fantastic and magnificent carvings. Examples of this decadent style are found in the Church of St. Maclou at Rouen and the façades of the cathedrals of Rouen, Rheims, and Troyes.

Gothic a. was adapted to all kinds of civil buildings, houses, and even shops, of which examples may be seen in many old Fr. towns. It was introduced into England at the time of the rebuilding of Canterbury Cathedral in the XII. cent., from France, but a dis-



STA MARIA MAGGIORE.

man occupation of Sicily, and by the Muhammadans, who ruled the island for two cent's, an original feature being the pointed arch, which is of Arabic origin.

In France, in addition to the Roman inspiration, a Byzantine influence is noticeable in the south, owing to trade with Venice and the East. In the churches there was a long nave with vaulted roof and with aisles, and transepts generally of small size, an apse at the eastern end with small apses radiating from it, and perhaps a central tower. Buttresses counteracted the lateral thrust of the stone vaulting of the nave, a difficulty which the Romans avoided by building the vaulted roofs in solid concrete, which simply rested upon the walls like a lid. The style of northern France is important to us in the development of Eng. a., and it was influenced by Ger. designs as well as by those of southern France, the Church of St. Étienne at Caen being a fine example of the style.

inctive Eng. style of a. was soon developed, called *Early English*, characterised by long and narrow pointed windows with little tracery, simple spires, high roofs, deep buttresses, slender columns with plain or foliage circular capitals, and deeply out mouldings to the arches. In plan, also, there are differences from the Fr. style, the transepts being more prominent—Salisbury Cathedral, for instance, has two transepts. The nave and transepts of Westminster Abbey and Elgin Cathedral are built in this style.

Towards the end of the XIII. cent. there was a transition to a more elaborate manner of a., the *Middle Pointed* or *Decorated* style, in which the windows are wider and divided by mullions, with tracery, at first geometrical, but later wavy and varied, in the upper part, the buttresses are more decorated, and the ornamentation and capitals of columns are richly carved. This is generally considered the finest period of the Gothic style, and is exemplified in the nave of York Minster and in parts of Melrose Abbey.

A cent. or more later this developed into the *Late Pointed* or *Perpendicular* style, marked by vertical tracery in the windows, panelling of the walls, flattened four-centred (Tudor) arches, fan-tracery, and other elaborations of the vaulting; Henry VII.'s Chapel at Westminster and the east window of Melrose Abbey are in this style, as are many churches in the south-west of England.

In Italy the Gothic style of a. never became popular. The earliest examples of Gothic work were carried out by Dominican or Franciscan friars from Fr. and Ger. prototypes, the Church of St. Francis at Assisi (1228-53) being a remarkable piece of early Italian Gothic a., notable for its wall frescoes. The Gothic cathedrals in Italy are of very great size. The vast Cathedral of Milan, the Church of St. Petronio at Bologna, designed on an even larger scale, the cathedrals of Siena, Florence, and Ferrara are all instances of the grandeur and the defects of this period and this type of Ital. a. In Venice the Byzantine a. was blended with the Gothic, a famous example being the Doge's Palace.

In Germany the best examples are directly modelled upon the great Fr. cathedrals, Cologne being little more than an enlargement, with differences in the detail, of Amiens. Strasburg Cathedral also shows the Fr. influence strongly. There are many town halls and other public buildings in Germany dating from this period, built in Gothic style.

In Belgium the Church of Notre Dame, at Antwerp, built in this style about 1360, is remarkable in having three aisles on each side of the nave, making its breadth equal to half its entire length; St. Croix, St. Martin, and St. Jacques at Liège, St. Bavon at Ghent, and Notre Dame at Bruges are good examples of the period, a notable feature of the Belg. churches being the richly decorated rood screens. The town halls of Brussels and Mons, and trade halls at Ghent and elsewhere show the style magnificently adapted to secular purposes.

With the exception of the choir of the Cathedral of Utrecht and one or two minor churches, Holland has no ecclesiastical Gothic work of importance, and there are but few examples of the style in domestic or civic a.

Spain, however, has several magnificent Gothic cathedrals. The cathedrals of Toledo, Leon, and Burgos, built in the Early Pointed style, are imposing in plan and beautiful in detail, the first being surpassed in size only by the cathedrals of Milan and Seville, while its general design is finer than that of either. Seville Cathedral (of later date), which has a very elaborate interior, and is the largest of mediæval cathedrals, was built on a site formerly occupied by and practically on the same plan as a great Moorish mosque.

Renaissance Architecture.—With the revival of classical literature and art in Italy in the XV. cent. there came the revival of Classical a., a style which had never altogether died out. In 1420 Brunelleschi was

entrusted with the task of completing the cathedral designed by Arnolfo del Cambio in Florence, and constructed a great dome over it, while he afterwards built several churches and other buildings modelled on classical forms. There sprang up a school of architects in Florence (Alberti, the author of several books on a., being the chief) who followed the lead of Brunelleschi, and constructed many great churches and palaces according to the classical ideas. These buildings are distinguished by a strong and massive appearance, the front of the stones on the lower parts of the walls being left rough, with deep channels at the joints. Milan adopted the classical ideas of Florence half a century later, and Venice was later still, developing a characteristic elegance of design with evidences still of Byzantine influence. St. Mark's Library and many of the palaces on the Grand Canal are built in this style. The classical movement did not begin to make headway in Rome till the beginning of the XVI. cent., when Bramante commenced the building of St. Peter's for Pope Julius II. in the classical style, but on his death, about six years later, the work was handed over to several successive architects, and little progress was made until it was confided to Michael Angelo. He died before the completion of the building, but it was finished according to his designs and models. St. Peter's is the largest church in the world, being almost 600 ft. in length, while the dome, 140 ft. in diameter, rises to a height of 430 ft. The interior, however, is lacking in imposing effect, as there is nothing to give it the proper scale.

Towards the end of the XV. cent. the a. of the Renaissance began to affect France, a style developing in which classical details were applied to general designs in the Gothic style; the Château of Blois (built about 1525), with its famous external staircase, is an example—the buttresses being replaced by pilasters and panels, the windows, chimneys, and similar parts of Gothic shape but with Renaissance detail. A later stage of the style is shown in the Louvre and the Tuileries in Paris; and, since the building of the Louvre progressed slowly through several cents., the changes in and gradual development of the style are excellently shown. The Luxembourg Palace, with rough stone façade like the Venetian palaces, the Hôtel des Invalides, with a fine central dome, and the Panthéon, formerly the Church of St. Geneviève, simply designed and with a dome modelled on that of St. Peter's at Rome, all three in Paris, are imposing examples of this Fr. style.

In England, as in France, the introduction of classical forms of a. was a very gradual process. Gothic a. had developed into a florid style usually termed *Tudor*, with flat, wide arches, elaborate and interlacing vaulted ceilings, and in domestic buildings, characteristic rectangular or polygonal low windows, octagonal towers at the entrances and elsewhere, highly ornamented doorways, while the long gallery usually on an upper floor was a distinctive feature. Classical details began to be added. Haddon Hall, for instance, built in the Tudor style, has classical detail of a modified type in its later parts, and at Hampton Court and elsewhere, as well as in many tombs, entrance gateways, and similar smaller pieces of a., classical details are incorporated. Hatfield House, Holland House, and Heriot's Hospital (Edinburgh) are well-known examples of the style of this period. In Wollaton Hall (built about 1590) the classical orders were freely used, along with other classical details, for the decoration. Inigo Jones (1572-1652), who had studied a. in Italy, built many noble edifices on classical models. His finest work was the designing of a great palace for Charles I. in Whitehall, the imposing Banqueting-Hall being, however, the only part actually built. Sir Christopher Wren (1632-1723) was more fortunate in his opportunities, for, soon after he had made a name as an architect, the Great Fire of London opened a wide field for him. He designed over fifty churches, the

Royal Exchange, Chelsea and Greenwich Hospitals, and numerous other great buildings, and rebuilt St. Paul's Cathedral on the lines of St. Peter's at Rome. The successors of Wren—Hawkmoor, Vanbrugh (the designer of Blenheim Palace), and others—built many works of note in the same classical spirit, and later in the XVIII. cent. Somerset House (built by Sir William Chambers), the Mansion House, and the Bank of England exemplify the imposing effects of the style.

In Spain the Classical style was grafted on to the Late Gothic a., and is distinguished by the plainness of the walls of buildings, decorative features being reserved for entrances and windows, while the upper storey is often adorned by an open arcade. The cathedral of Valladolid and the portal of the cathedral of Malaga are among the best examples of Span. Renaissance a. as applied to churches, those of this period being often notable for their magnificent iron grilles to the chapels. Civil buildings were greatly influenced by the Moorish style, one of the earliest being the palace adjoining the Alhambra at Granada, while the enormous palace of the Escorial at Madrid is of Renaissance design.

Muhammadian Architecture.—The first places of worship of the Muhammadans were not of definite design, any suitable building being employed for the purpose, but gradually a distinctive style was built up of Egyptian, Roman, and Byzantine elements, differing in detail in the different Muhammadan countries, mosques being constructed so that the worshippers faced towards Mecca, the birthplace of the Prophet, the general form being flat-roofed, arcaded cloisters enclosing a square courtyard. The earliest appearance of the pointed arch is in the Mosque of Tulun in Cairo (built in 879), and it is a characteristic of the style, except in the Barbary States and Spain, where the horseshoe arch is more popular. Slender minarets, generally octagonal and of various designs, for the purpose of calling the faithful to prayer, were at an early period added to the mosques. The *Alhambra* at Granada (begun in 1248), a great palace and citadel, is the finest building in this style, the Alcazar at Seville and the mosque at Cordova being in a more dilapidated or much altered condition. On the capture of Constantinople by the Turks the Church of St. Sophia was converted into a mosque, and it has since served as a model, with the addition of actual Muhammadan details, for Muhammadan mosques.

Indian Architecture.—Architectural history begins with introduction of stone in 250 B.C. in place of wood, in reign of Buddhist emperor, Asoka. Six styles—

I. **BUDDHIST** (India and Ceylon); principal objects—(a) *stambhas* or *idols*, pillars bearing inscriptions on shafts; (b) *stūpas* or *topes*, relic-shrines, most important groups—Bhilsa and Amaravati Stūpas; (c) *rahis* surrounding topes, etc.; most interesting at Bharaut; (d) *chaityas* or assembly halls, corresponding to Christian church in use, plan, position of altar, aisles, etc.; extant examples all rock-cut, chiefly in Bombay Presidency; (e) *vihāras* or monasteries, principal ones at Ellura, Ajanta, Nasik.

II. **DRAVIDIAN** (S. India); best period, XV. to XVIII. cent. A.D. Temples consist of four parts: (a) principal part, *vimāna*, square in plan, surmounted by pyramidal roof of one or more storeys, and containing cell in which image of god is placed; (b) porches, *mantapams*, covering and preceding door leading to cell; (c) gate-pyramids, *gopurams*, principal features in quadrangular enclosures surrounding more notable temples; (d) pillared halls or *chāwadis*. Famous temples: Tanjore, Conjivaram, Rameswar, Madura.

III. **CHALUKYAN** (Deccan and Mysore); arose from Dravidian, but became distinct c. X. cent. A.D.; plan generally Dravidian, but corners more prominent and pillars markedly different; favourite arrangement was grouping of three shrines round central *mandap* or hall; best specimen at Itagi (Haidarabad).

IV. **JAINA** architecture, like religion, closely re-

sembles Buddhist; Orissa rock-cut caves date from II. cent. B.C.; characteristic structural feature of style is twelve-pillared dome; temples generally grouped together in 'cities' on summits of hills. Famous 'cities of temples' are Satrunjaya, Girnār, Mt. Abu.

V. **INDO-ARYAN** (N. India), most interesting and complete Hindu style; chief features:—ourvilinear outline of pyramid on polygonal base; no storeys; no pillars. Best examples: Orissa group of temples, particularly Bhuvaneswar and Jagannath.

VI. **INDIAN SARACENIC**, introduced by Muhammadans and possessing characteristic Saracenic features; about fifteen styles, divisible into two periods: (a) 1000 to 1500 A.D.; Pathan and other styles moulded by strong Hindu and Jain influences; (b) 1500 to 1750 A.D.; brilliant Mughal style which created Taj Mahal and Moti Masjid (Agra), Akbar's Tomb (Sikandra), Mosque and Palaces (Delhi).

Fergusson, *Indian Architecture*, 2 vols.

Modern Architecture.—During the XIX. cent. England has passed through several periods of revivals of different styles of a. At the beginning of the cent. there was a revival in classical a., the Church of St. Pancras and Univ. College in London, the old Parliament House in Dublin (now the Bank of Ireland), and the Art Galleries and Royal High School in Edinburgh being good examples of the period, modelled upon Gr. prototypes. St. George's Hall, Liverpool, was somewhat later in date, and marks the culmination of the revival. Gothic a. had also a number of eager advocates, more especially Sir Gilbert Scott and G. E. Street, and when Ruskin threw his influence on its side it became adopted as the general style for church a. as well as for some great secular buildings, notably the Houses of Parliament (designed by Sir Charles Barry) and the New Law Courts (by Street). In the latter part of the cent. the Renaissance style was generally adopted for civil and domestic a., particularly in the modified form known as the *Queen Anne* style (e.g. Chelsea Town Hall).

In France the Renaissance style is the most popular fashion of a., the new Sorbonne and the École de Médecine being imposing edifices designed according to its principles. In Germany, Italy, Belgium, and Austria the tendency has been to follow pure classical examples, the Law Courts at Brussels being a very remarkable example of modern genius applied to the classical style, while in Germany there is also a tendency towards Renaissance a. Mention must also be made of an important revival of Byzantine a. at the beginning of the XX. cent. in England, the R.C. Cathedral of Westminster being an imposing structure in this style. In America there has been a development of tower-like buildings, or 'sky-scrapers,' composed of a great number of storeys to which access is gained by lifts, due at first to the restricted space of the business quarter of New York, but now characteristic of all the great American cities, and latterly constructed of frameworks of steel, on which the building really depends, with an outer shell of masonry.

History of Architecture, Fergusson; *Gothic Architecture*, Pugin; *History of Architecture*, Sturgis; *Elements of Architecture*, Gwilt; *Byzantine and Architecture*, Jackson (1913).

See also ARSE, AQUEDUCT, ARCHE, BASILICA, BATHS, BRIDGES, CRYPT, DOME, MOSQUE, PYRAMID, TEMPLE, and similar articles.

ARCHITRAVE, architectural term for part of entablature (in the five Orders) which rests on columns below the frieze.

ARCHIVES (Gr. *archion*, state depository), place where MS. records are kept. Eng. national depository is known as Record Office (Chancery Lane, London); those of France, Germany, and other countries are called National or State A.; local Record Offices were set up in some Eng. counties in early XVIII. cent.; Ireland and Scotland have separate a.; Germany has no imperial a., but there are state a. in nearly every province, state, and town.

and central *Geheimes Staatsarchiv*, Berlin, Royal *Hausarchiv*, Charlottenburg. France, besides *A. Nationales* and *A. des Ministères*, has 87 departmental *a.* Italian depositories are the Vatican, and 18 state *a.* Spain's *a.* are at Madrid, Barcelona, and Simancas; those of Holland and Belgium at capitals of those countries.

ARCHON, the chief Athenian magistrate after the abolition of the monarchy following the death of King Codrus (c. 1068 B.C.). The latter's *s.*, Medon, was the first *a.*, and the office was at first for life. At a later period it was limited to ten years, and though first confined to the descendants of Codrus, it was afterwards open to the nobles, and finally to all citizens. In 683 B.C. the office was limited to a year only. During the VII. cent., besides the first, or king's *a.*, there was a second who had control of the religious affairs, a third who was the commander-in-chief, besides six judges, or 'keepers of the law,' thus raising the number of *a.*s to nine.

ARCHPRIEST, official in Christian Church now replaced by rural dean.

ARCHYTAS OF TARENTUM (fl. 347 B.C.), Gk. philosopher and mathematician; intimate friend of Plato; invented a primitive flying-machine; and was the first to apply geometrical ideas to mechanics.

ARCIS-SUR-AUBE (48° 32' N., 4° 7' E.), town, on Aube, France; birthplace of Danton; Napoleon was defeated here by the allied forces under Schwarzenberg, March 1814.

ARCOLA (45° 20' N., 11° 17' E.), village, Italy; Austrians defeated by Napoleon, 1796.

ARCOS DE LA FRONTERA (36° 46' N., 5° 46' W.), town, Spain. Pop. 14,000.

ARCOT (12° 53' N., 79° 20' E.), town, India; taken by Clive, 1751; by French, 1758; British, 1760; Haidar Ali, 1781; ceded to Britain, 1801. Pop. c. 11,000.

ARCOT, NORTH (13° 26' N., 79° 29' E.), district, India; area, 7386 sq. miles. Pop. 2,200,000.—**SOUTH A.** (12° 3' N., 79° 11' E.), district, India. Pop. 2,350,000.

ARCTIC (66° 30' N.), N. Polar regions.—**Arctic Circle and Arctic Ocean**, see **POLAR REGIONS**.

ARCTINUS OF MILETUS (fl. 744 B.C.), Gk. epic poet; continued the Trojan story from the close of the *Iliad*. (Lang's *Homer and the Epic*, 1893.)

ARCTURUS (a *Boötis*), most brilliant star in N. hemisphere, almost in line with tail of Great Bear.

ARCUEIL (48° 45' N., 2° 21' E.), town, Seine, France. Pop. 8600.

ARCULF (VII. cent.), Gallican ecclesiastic who visited Britain (Bede's *History*).

ARDAHAN (41° 8' N., 42° 47' E.).—(1) Town, Armenia, Asiatic Turkey. (2) Fortress, Transcaucasia, Russia.

ARDALAN (35° 40' N., 45° 40' E.), province, Persia, forming E. part of Kurdistan.

ARDASHIR, the recognised transliteration of Artaxerxes (*q.v.*), a Persian royal name; Armenian form of name is Artaxias. Three kings of Achaemenian dynasty bore the name; also three kings of dynasty of Sassanides; **ARDASHIR I.** (d. 241 A.D.), founded Sassanian empire.

ARDEA (41° 36' N., 12° 36' E.), old Latian town, Italy; now a village surrounded by marshes; ancient remains.

ARDEBIL (38° 14' N., 48° 21' E.), town, Persia. Pop. c. 10,000.

ARDECHE (44° 37' N., 4° 20' E.), department, Central France, W. of Rhône; rugged and mountainous; occupied by Cévennes; watered by river A.; olives, vines, mulberries, silk; iron mines. Pop. (1911) 332,000.

ARDEE (53° 51' N., 6° 32' W.), town, County Louth, Ireland.

ARDEN, FOREST OF (c. 52° 15' N., 1° 50' W.), one of the largest of ancient British forests, said to

have extended from Avon to Trent; now wooded district, N. Warwickshire.

ARDENITE, yellowish silicate of vanadium.

ARDENNES (50° 5' N., 5° 30' E.), hilly district, France and Belgium; formed one forest in Rom. times; large part still forested; horses raised.

ARDENNES (49° 33' N., 4° 30' E.), department, France; hilly, forest country; crossed by A. canal, connecting Meuse and Aisne; woollens, iron and copper works; cereals, fruit, potatoes; contains Sedan; area, 2027 sq. miles. Pop. (1911) 319,000.

ARDGLASS (54° 16' N., 5° 37' W.), town, County Down, Ireland.

ARDITI, LUIGI (1822-1903), Ital. composer; known for his vocal waltz, *Il Bacio*, and his operas, *La Spia* and *I Briganti*.

ARDMORE (34° 11' N., 97° 8' W.), town, Oklahoma, U.S.A. Pop. 9000.

ARDNAMURCHAN POINT (56° 44' N., 6° 14' W.), headland, coast of Argyll, Scotland; most westerly point of mainland; scene of many wrecks.

ARDOCH.—(1) (57° 24' N., 5° 36' W.) town, Ross-shire, Scotland. (2) (56° 3' N., 4° 32' W.) town, Dumbartonshire, Scotland. (3) (56° 17' N., 3° 52' W.) village and old Rom. camp, Perthshire, Scotland.

ARDRES (50° 50' N., 1° 58' E.), town, Pas de Calais, France; near A., in 1520, Henry VIII. and Francis I. met at the famous *Field of the Cloth of Gold*.

ARDROSSAN (55° 39' N., 4° 49' W.), port, Ayrshire; good harbour; service to Ireland; shipbuilding. Pop. (1911) 5760.

ARE, see **WEIGHTS AND MEASURES**.

ARECA, see **BETEL NUT**.

ARECIBO (18° 31' N., 66° 47' W.), port, Porto Rico. Pop. 8000.

ARENBERG, or **ARENBERG**, formerly *Berg*, a duchy situated between Juliers and Cologne, now included in Prussian administrative district of Coblenz.

ARENA (Lat. 'sand'), originally the central space in an amphitheatre, so named from its being strewn with sand; now used for any place of public contest.

ARENACEOUS, applied to rocks made up of sand particles, as *argillaceous* to those made up of clay.

ARENARIA, see **CARYOPHYLLACEÆ**.

ARENDAL (58° 30' N., 8° 42' E.), port, Norway. Pop. (1910) 10,300.

ARENDS, LEOPOLD (1817-82), Russ. author of poems and criticism, and of new system of shorthand, first set forth 1850.

ARENIG GROUP, lowest formation of Ordovician rocks in Britain, consists of dark slates (quarried in Wales), shales, grit, and limestones.

ARENSKIJ, ANTON STEPANOVICH (1861-1906), Russian composer, director of imperial choir, St. Petersburg; wrote operas and miscellaneous music.

AREOI, a secret society which flourished in the South Pacific Islands and was chiefly concerned with the worship of the reproductive powers of nature. Its ceremonies included obscene dances, and were attended with much debauchery.

AREOPAGUS (c. 37° 58' N., 23° 44' E.), hill, Athens; about 360 ft. high; often called Hill of Mars (mentioned in *Acts*); gave name to oldest Athenian court, which met in open air and was composed of former chief-magistrates of Athens. Its functions were modified by Solon's reforms in constitution, 594 B.C.; and its influence was decreased when Cleisthenes established his democratic constitution. In later times most of its functions were transferred to other bodies; existed in Roman times.

AREQUIPA (16° 22' S., 72° 12' W.), department, Peru. Area, 22,000 sq. miles. Pop. 172,000.

AREQUIPA (16° 20' S., 71° 35' W.), cathedral town, Peru; univ. Pop. 40,000.

ARES (classical myth.), the god of war, who revelled in slaughter, and was hated by all the deities of Olympus, save Aphrodite alone. He was wounded by Diomedes at the siege of Troy; known to the Romans under the name of Mars.

ARETÆUS (I.-II. cent. A.D.), Gk. physician, of Cappadocia; practised in Rome; author of admirable medical treatises in Ionic Greek.

ARETHAS (X. cent.), Byzantine theologian; wrote commentary on Apocalypse.

ARETHUSA (classical myth.), a nymph of Artemis, by whom she was changed into a fountain to enable her to escape the pursuit of the river-god Alpheus. The famous fountain bearing her name is in the island of Ortygia, near Syracuse.

ARETINIAN SYLLABLES, used in musical notation of Guido d'Arezzo (XI. cent.), who is supposed to have adopted them (*ut, re, mi, fa, sol, la*), from initial syllables of hemistichs of hymn to St. John Baptist.

ARETINO, PIETRO (1492-1556), Ital. author; writer of comedies, sonnets, and dialogues, many of which were satirical, and all licentious. He called himself the 'Scourge of Princes,' and succeeded in wringing money out of the nobility and other eminent people, who went in fear of his satire.

AREZZO (43° 28' N., 11° 52' E.).—(1) cathedral town, Italy; birthplace of Petrarch, Guido, Vasari; interesting buildings and artistic remains. Pop., commune (1911), 47,500. (2) province, Italy; area, 1273 sq. miles. Pop. (1911) 284,500.

ARGALI (*Ovis ammon*), large wild sheep of Siberian mountains.

ARGALL, SIR SAMUEL (c. 1580-1626), Eng. administrator of Virginia (1617-19); defeated Indians, 1612; French, in Nova Scotia, 1613; and assisted in attack on Cadiz, 1625-26.

ARGAND, AIME (1755-1803), Swiss physician; invented lamp-burner, called after him by Quinquet, in which wick rises, forming hollow circle; effect, increase of light and heat.

ARGAO (9° 55' N., 123° 35' E.), town, Panay, Philippines; cacao. Pop. 35,500.

ARGAUM (21° 10' N., 76° 57' E.), village, Central Provinces, India. Here Wellesley defeated the Marhattas, 1803.

ARGELANDER, FRIEDRICH WILHELM AUGUST (1799-1875), Ger. astronomer; pupil of Bessel; successively director of Abo, Helsingfors, and Bonn observatories; his great work is on observation of position of more than 300,000 stars.

ARGENS, JEAN BAPTISTE DE BOYER, MARQUIS D' (1704-71), Fr. man of letters; wrote *Lettres Juives*.

ARGENSOLA, LUPERCIO LEONARDO DE (1559-1613), Span. dramatist and poet; wrote three plays, which are mentioned in *Don Quixote*, but is chiefly remembered by his sonnets and other poems. His bro., Bartolomé Leonardo (1562-1631), was known as an historian and poet, and wrote *Conquista de las Islas Molucas*, and other works in prose and verse.

ARGENSON, D', name of a Fr. family, some members of which were intimately connected with national affairs from the time of Louis VIII. down to the latter half of the XIX. cent. (1) René de Voyer, Seigneur d'A. (1596-1651), enjoyed the favour of Cardinal Richelieu, to whom he owed various State appointments, and was made Ambassador to Venice by Mazarin. (2) Marc René de Voyer, Marquis d'A. (1652-1721), was Chief of Police in Paris (1697-1718), Pres. of the Council of Finance (1718-20), during which time he became implicated in the disastrous financial schemes of John Law, which brought about his downfall. (3) René Louis Voyer, Marquis d'A. (1694-1757), s. of the preceding, Sec. for Foreign Affairs (1744-47), author of *Considérations sur le Gouvernement de France* (1764), but is chiefly remembered by his *Mémoires*, which are full of valuable information regarding the period in which he lived. (4) Marc Pierre de Voyer, Count d'A. (1696-1764), bro. of last-named; War Minister (1742-57); was the friend of Diderot and Voltaire; incurred the dislike of Madame de Pompadour, through whom he was exiled, but was permitted to return to Paris after

her death. (5) Marc René de Voyer, Marquis d'A. (1771-1842), who was some time aide-de-camp to Lafayette during the Revolution, but was later wrongfully denounced as a royalist conspirator.

ARGENTAN (48° 44' N., 0° 1' W.), town, on Orne, France; castle and church dating from XV. cent. Pop. 6290.

ARGENTATE, chemical compound with silver as metallic radical.

ARGENTEUIL (48° 56' N., 2° 14' E.), town, on Seine, France. Pop. 17,300.

ARGENTIÈRE, COL D' (44° 50' N., 6° 31' E.), mountain pass (8545 ft.) in Alps used from Roman times; Napoleon made carriage-road over it.

ARGENTINE (39° 5' N., 94° 40' W.), town, Kansas, U.S.A. Pop. 6000.

ARGENTINE REPUBLIC, REPUBLICA ARGENTINA (22° to 55° S., 54° to 73° W.), federal republic, S. America; length, c. 2300 miles; width, c. 800 miles; area, c. 1,100,000 sq. miles; bounded N. by Bolivia, N.E. by Paraguay, E. by Brazil, Uruguay, S. Atlantic, W. by Chile. Surface slopes gradually from foothills of Andes on W. towards E., and almost whole consists of great plains. Of flat ground, northern part is densely wooded, central pampas portion has great stretches of treeless pasture, and southern portion contains expanses of stony desert with patches of stunted thorn bush. Drainage of N. and centre is carried off by Paraná (with tributaries Pilcomayo, Vermejo, Salado) and Uruguay, which forms boundary with republic of Uruguay; farther S. are rivers Colorado, Negro, Chubut, Chico, and Santa Cruz; and in interior numerous streams end in marshes. Rainfall over great part of country is from 30 to 40 in., but diminishes in some places to 3 in.

History.—Aborigines belonged to Ando-Peruvian, Pampean, and Brasilio-Guaranian races. History begins with coming of Spaniards to River Plate in XVI. cent. First explorer, Juan Diaz de Solis, was killed and devoured by natives, 1516. Cabot's expedition in 1526-27, though more successful, had no permanent effect. Mendoza in 1535 founded first town at Buenos Aires, which was continually beleaguered by Indians and abandoned soon afterwards. Other explorers followed, but not until 1580 was permanent town built at Buenos Aires by Juan de Garay, who had already founded Santa Fé at junction of Paraná and Paraguay. In 1620 River Plate country was divided into two provinces, marking beginning of A., which then included Buenos Aires, Santa Fé, Entre Rios, Corrientes, Uruguay; whole remained under Viceroyalty of Peru. Gov. of A. at this time was Saavedra, founder of Argentine prosperity, and one of great heroes of Argentine history. In 1776 A. became a viceroyalty, and under Cevallos, first viceroy, trade was greatly expanded. During Fr. Revolutionary wars Great Britain, considering Spain's consent to a financial subsidy of France an act of hostility, sent two expeditions against Buenos Aires, both of which were repulsed by Argentines unaided by mother country. This led to formation of patriotic party. Spain's authority was set aside and independent government formed, May 25, 1810; struggle ensued; independence formally declared, 1816. After several victories gained by San Martín (great national hero) over Span. troops, congress met at Buenos Aires, 1822; independence recognised by U.S.A., 1823, Britain, 1825, Spain, 1842. New constitution was formed in 1853, which, with modifications introduced in 1866 and 1898, still exists. Since establishment of autonomy principal events have been war against Brazil, 1825-27; against Paraguay, 1865-70; various revolts and revolutions, after one of which, in 1890, there occurred a great financial crisis. There have also been boundary disputes with Brazil and Chile, settled respectively, 1895 and 1902.

Government.—Republic consists of fourteen provinces, ten territories, and one federal district (Buenos Aires city). Of former, four—Buenos Aires, Santa Fé,

Entre Rios, Corrientes—lie along River Plate; four—**Rioja, Catamarca, San Juan, Mendoza**—along Andes; three—**Cordoba, San Luis, Santiago del Estero**—in centre; three—**Tucuman, Salta, Jujuy**—in N. Territories are **Formosa, Chaco, Misiones, Pampa, Rio Negro, Neuquen, Chubut, Santa Cruz, Tierra del Fuego**. Constitution (1853) is based on U.S.A. Pres. is elected for six years by specially chosen representatives of provinces. National Congress comprises Senate (30 members) and House of Deputies (number of members varies according to population; in 1910, 120). Vice-Pres. acts as chairman of Senate. Ministry consists of eight Sec's of State. Each province has its own Legislature and local self-government; territories are under federal governors. Chief towns are Buenos Aires (capital), Rosario, La Plata, Tucuman. Buenos Aires and Ensenada are best harbours. Language is Spanish. Primary and secondary education are free; former obligatory for children from six to fourteen. Army is a National Militia; service compulsory. There is a small navy. Roman Catholicism is state religion.

COMMUNICATIONS.—There is coast-line of about 2700 miles; Paraná and Uruguay are navigable for many hundred miles. Railway mileage in 1911 was over 25,000 miles, and is being further developed. Trans-Andine railway (opened 1910) connects A. with Chile. Road communication is difficult owing to lack of road metal.

Resources and Production.—In N. are forests of hardwood, invaluable for railway sleepers, and quebracho, used in tanning; here are produced tobacco, jute, ramie, sugar, castor oil, fruits. In Andes regions are magnificent pine forests. In extreme S. seal-hunting and ice-collecting are carried on. There are many fibre-producing plants. Most economic minerals occur, but await development; coal is deficient. Agriculture and pasture are chief sources of wealth. Large numbers of sheep and cattle are raised; dairying important. A. is second wool-producing country in world. Horses, mules, asses, goats, and pigs also raised in large numbers. Chief crops are wheat, linseed, oats, barley, bird seed, rye, maize; sugar-cane and vines also cultivated. Imports include cottons, linens, coal, machinery, iron, beer, silk, cement, motor-cars, hardware, food-stuffs, agricultural implements, etc.; exports animals, wool, hides, frozen meat, butter, sugar, wheat, maize, etc. About one-third of import and one-sixth of export trade is with Great Britain. Pop. (1911) was estimated at 7,172,000; immigrants are chiefly Spaniards and Italians; also French, British, and other nationalities.

Handbook of Argentine Republic (Washington, 1903); *Argentine Year Book*; W. A. Hirst, *Argentina* (1910); W. H. Koebel, *Argentina, Past and Present* (1910).

ARGENTITE (silver glance), Ag₂S, grey lustrous silver ore occurring in mineral veins mined in Mexico, occasionally crystallised in cubes or octahedra.

ARGENTON (46° 35' N., 1° 30' E.), town, on Creuse, France. Pop. 6300.

ARGHOUL, Egyptian wind instrument, consisting of two reed pipes of unequal length, the smaller of which is pierced with six holes; it is of great antiquity, and is still used.

ARGILLACEOUS, see **ARENACEOUS**.

ARGO (classical myth.), see **ARGONAUTS**.

ARGO (*Argo Navis*), largest southern constellation; subdivided into four smaller groups: *Malus* (mast), *Vela* (sails), *Puppis* (stern), and *Carina* (keel); contains *Canopus*, brightest star in the sky except *Sirius*.

ARGOL, **TARTAR**, deposit which forms on fermentation of wine.

ARGOLIS (37° 35' N., 23° 5' E.), nomarchy, Greece.

ARGON (A=39.9), colourless, odourless, chemically inactive, gaseous element, constituent (c. 0.8 %) of atmospheric air; B.P. -186°-1, M.P. -189°-6. Characteristic spectrum 'changing from red to a rich steel blue' (Crookes). The fact, already observed by Cavendish in 1785, that the density of nitrogen ob-

tained from the atmosphere is about $\frac{1}{3}$ % greater than that of nitrogen prepared from its compounds, led to the discovery of a., in 1894, by Lord Rayleigh and Sir William Ramsay. It is isolated from the air by passing it over red-hot copper to remove the oxygen, and over magnesium to bind the nitrogen; it has also been prepared by electro-chemical methods. The elements *krypton*, *neon*, and *xenon* were afterwards discovered by Ramsay occurring in small proportions with a.

ARGONAUTA, a genus of Cephalopoda (g.v.).

ARGONAUTS (classical myth.), a band of heroes who sailed with Jason, in the ship *Argo*, to Colchis, to recover the *Golden Fleece*, which was guarded by a sleepless dragon. The venture proved successful, through the aid of the king's dau. Medea, who became the wife of Jason.

ARGONNE (49° 8' N., 5° E.), hilly district, France, between Meuse and Aisne; forested.

ARGOS (37° 37' N., 22° 48' E.), town, E. Peloponnesus, Greece; acropolis, ancient theatre. A. in ancient times was predominant Hellenic state in Greece, power extending over most of Peloponnesus in VIII. cent. B.C. under ruler Phidon; a Doric city, famed for cult of Hera, whose temple, Heraion, stood on hill between A. and Mycenae. In the long struggle between A. and Sparta, the latter ultimately attained ascendancy, c. 500 B.C. After various wars and alliances A. joined Achæan League, 229 B.C., to which it adhered until Roman conquest, 146 B.C.; prospered under Romans; held by Franks for time in XIII. cent.; burnt by Turks, 1825; modern town is straggling place, chiefly agricultural. Pop. c. 10,000.

ARGOSTOLI (38° 10' N., 20° 30' E.), port, Cephalonia, Greece. Pop. 9200.

ARGOSY, poetic name for a ship carrying a rich cargo, derived originally from vessels sailing from the Adriatic port of Ragusa (sometimes spelled Argosa).

ARGOT, see **SLANG**.

ARGUELLES, AUGUSTINO (1778-1844), Span. patriot and statesman; on account of his liberal views was imprisoned (1814-20); exiled (1823-32); subsequently Pres. of Chamber of Deputies.

ARGUIN (20° 15' N., 17° 45' W.), island, Fr. W. Africa.

ARGUS (classical myth.).—(1) S. of Inachus; had one hundred eyes; guardian of Io; slain by Hermes (Mercury). His eyes were afterwards transferred by Hera (Juno) to the tail of the peacock, a bird which was sacred to her. (2) The builder of the ship *Argo*. (3) A dog belonging to Odysseus, which knew its master after an absence of twenty years.

ARGYLL, EARLDOM AND DUKEDOM OF, honours borne by the Campbells of Lochtawe, Lord Colin C. being cr. 1st earl (1457); 2nd earl was killed at *Flodden*; 4th earl (d. 1558) was distinguished as being amongst the earliest of the Scot. peers to adopt principles of the Reformation; 5th earl (1530-73) was a Lord of the Congregation, notorious as being implicated in the Darnley murder, and became Chancellor under Regent Morton. Archibald C., 8th earl (1598-1661), was cr. marquis in 1641; noted for his seriousness of character and religious zeal, and though attached to Charles I. took the side of the Covenanters, raised an army, and was defeated by Montrose (g.v.) in 1644. He was opposed to the execution of Charles I., supported the cause of Charles II., but subsequently made his submission to Cromwell, for which he was called to account at the Restoration, condemned, and beheaded at the cross of Edinburgh. This marquis is dealt with in Scott's *Legend of Montrose*. The 9th earl (1629-85) was executed for participation in Monmouth rebellion; 10th earl (1651-1703), cr. duke (1701), actively promoted Revolution (1688), and was notorious for his association with massacre of Glencoe. John, 2nd duke (1678-1743), cr. Baron Chatham and Earl of Greenwich (1706) for distinguished services under Marlborough, led Royalist troops against Jacobites at Sheriffmuir (1716), and

was cr. Duke of Greenwich (1718); dealt with in Scott's *Heart of Midlothian*. George, 8th duke (1823-1900), was Lord Privy Seal (1852), Postmaster-General (1855), and Indian Sec. (1868); also noted as author of *Poems* (1894), *Primeval Man*, *The Unity of Nature*, etc. His s. John (1845-), 9th duke, m. (1871) Princess Louise; was Gov.-General of Canada (1878-83); author of *Canadian Pictures*, *Memories of Canada and Scotland*, *Life of Queen Victoria*, etc.

ARGYLLSHIRE (56° 20' N., 5° 30' W.), county, W. Scotland; besides irregularly shaped part of mainland, includes Mull, Islay, Jura, and many other islands; surface mountainous; highest peak, Ben Cruachan; coast-line deeply indented by arms of sea—Loch Long, Loch Fyne, Loch Linnhe, etc.; chief inland lake, Loch Awe; capital, Inveraray; largest towns, Campbeltown, Dunoon, Oban; Crinan Canal (opened 1801) connects Ardrishaig with Crinan; fine moors and deer forests; Highland cattle bred, sheep largely raised; quarrying, fishing, distilling. A. was held by independent princes till 1222, when became sheriffdom; after struggles between rival great families, Campbells became supreme and have held earldom (later dukedom) of Argyll since 1457; other important family, Macdonald of the Isles. Area, 3110 sq. miles. Pop. (1911) 70,900.

ARGYRODITE (Ag₂GeS₃), black purplish mineral crystallising in cubic system, found in Freiberg (Saxony) and Bolivian silver mines.

ARGYROKASTRO (40° 10' N., 20° 8' E.), town, Turkey. Pop. c. 11,000.

ARGYRONETA, see *ARACHNIDA*.

ARGYROPULOS, IOANNES (c. 1416-86), Gk. humanist; trans. Aristotle into Latin.

ARIA (*Ital.*), an ornate melody sung by a single voice in grand opera, oratorio, etc.

ARIADNE (classical myth.), dau. of Minos, king of Crete, who, when Theseus was confined in the labyrinth for the purpose of slaying the Minotaur, gave him a clue to its mazes. After his escape Theseus married Ariadne, but eventually abandoned her in the isle of Naxos.

ARIANO DI PUGLIA (41° 10' N., 15° 7' E.), town, Italy. Pop. 8400.

ARIAS MONTANO, BENITO (1527-98), Span. Orientalist.

ARICA (18° 28' S., 70° 20' W.), town, Tacna, Chile; port for Bolivia.

ARICIA (41° 44' N., 12° 41' E.), ancient town, Italy; modern, Ariccia. Pop. 3000.—*Aricini*, ancient people of Aricia.

ARIEGE (42° 56' N., 1° 25' E.), frontier department, France, extending up northern slope of Pyrenees; forests; iron, lead, copper, manganese; cereals, fruit; area, 1892 sq. miles. Pop. (1911) 198,700.

ARIEL, satellite of Uranus.

ARIES (the Ram), constellation marking first sign of Zodiac (*g.v.*), symbolised by ♈. The point where the sun, passing through the intersection of the plane of the earth's equator and the *ecliptic* (the plane of its revolution round the sun), crosses from south to north of the equator formerly marked its entry into A., and was called the *First point of Aries*, or the *Spring Equinox*. It was used as the zero line of celestial measurements. The other point of intersection of these two planes, through which the sun crosses from north of the equator to south, is the *Autumnal Equinox*. See *PRECESSION*.

ARIKARA, N. Amer. Indians, now in N. Dakota.

ARIMASPI, ancient Scythian people; said to have been one-eyed; waged war on griffins.

ARIMATEA, town, Palestine, mentioned in Bible; site now unknown.

ARIMINUM (44° 5' N., 12° 30' E.), town, Italy; modern Rimini (*g.v.*).

ARINE, species of parrots with cuneiform tail.

ARIOBARZANES, king of Cappadocia; supported Pompey, and afterwards favoured by Julius Caesar.

ARION (fl. 625 B.C.), celebrated lyric poet of Lesbos; went to Italy with Periander, tyrant of Corinth, where he acquired great riches. When he was returning to his own land, the sailors sought to murder him and possess themselves of his wealth. A. obtained permission to sing before his death, and the exquisite sound of his voice drew a number of dolphins around the ship. A. flung himself into the sea, and one of them bore him to safety.

ARIOSTO, LUDOVICO (1474-1533), Ital. poet; b. Reggio, in Lombardy; studied law (which he disliked) for five years, but subsequently devoted himself to literary composition. Some of his early work in the comic vein attracted the attention of Cardinal d'Este, who took the young poet into his service, but rewarded him only with a beggarly pittance. Later he transferred his services to the cardinal's bro., the Duke of Ferrara, and became governor of Garfagnana for three years; afterwards returned to Ferrara. A. is chiefly remembered for his immortal epic, *Orlando Furioso*, which he grafted on to an earlier attempt at epic-writing by Boiardo, entitled the *Orlando Innamorato*. This great work, which deals with the wars of Charlemagne with the Saracens, and more intimately with the loves of Ruggero and Bradamante, was begun in 1503, first b. in 1516, but was continually being corrected and improved up to the time of the poet's death, which was due to consumption. The best Eng. trans. is that by W. S. Rose (1823). A. was also the author of a number of comedies, satires, and lyrical pieces.

ARIOVISTUS, Ger. chief, defeated by Julius Caesar, 58 B.C., near Belfort.

ARISTA, bristle-like process on certain flies; awn.

ARISTEUS (classical myth.), Gk. deity, s. of Apollo and Cyrene; m. Autonoe, dau. of Cadmus; was f. of Acteon; famed for benevolence; protector of the vine, olive, and bees, also of hunters and herdsmen.

ARISTAGORAS (d. 497 B.C.), tyrant of Miletus; revolted against Darius, 500; aided by Athenians.

ARISTANDER, soothsayer to Alexander the Great.

ARISTARCHUS OF SAMOS (c. 250 B.C.), Gk. astronomer; anticipated heliocentric theory of Copernicus.

ARISTARCHUS OF SAMOTHRACE (fl. 150 B.C.), Gk. grammarian; founder of the Aristarchean school of philologists which flourished at Alexandria and Rome; famous for his editions of Sophocles, Aeschylus, and other Gk. poets; and more particularly for his exhaustive labours in idding text of Homer of interpolations.

ARISTEAS (c. 300 B.C.), Gk. poet; author of *Arimatea*. The accounts of his life are partly mythical, but he is mentioned by Herodotus.

ARISTIDES, THE JUST (c. 530-468 B.C.), Athenian statesman; strategist at *Marathon*; chief archon (489); ostracised for opposing Themistocles' naval policy (c. 484); distinguished himself at *Salamis* and *Plataea*; commander of fleet (477); as result of probity died poor.

ARISTIDES (fl. II. cent. B.C.), Gk. author, who wrote a number of *Milesian Tales*, and is said to have been the pioneer of Gk. prose romance.

ARISTIDES, writer of a valuable Christian apology which was read by its author to the Emperor Hadrian when he visited Athens. (Eng. trans. by W. S. Walford, 1909.)

ARISTIDES, ELIUS, THEODOBUS (129-189), Gk. rhetorician. His rhetorical works were held in great regard by his contemporaries, and A. enjoyed the close friendship of the Emperor Marcus Aurelius.

ARISTIPPUS (fl. 356 B.C.), Gk. philosopher; founded Cyrenaic school; he regarded the pursuit of pleasure as one of the principal means of happiness, to which external luxury was a necessary adjunct.

ARISTO OF CHIOS (fl. 250 B.C.), Stoic philosopher; a follower of Zeno; devoted especially to study of ethics.

ARISTO OF PELLA (II. cent.), Jewish Christian writer; author of a famous *Dialogue*; referred to by Eusebius.

ARISTOBULUS (IV. cent. B.C.), Gk. historian, intimate companion of Alexander the Great; wrote a history of his campaigns.

ARISTOBULUS (II. cent. B.C.), Jewish Peripatetic philosopher; wrote commentaries on writings of Moses, quoted by Eusebius and others.

ARISTOCRACY, term used by Aristotle to mean 'the rule of the best'; hence, *right* government by a small privileged class. The term in modern English is used in reference to members of the peerage, a limited number of whom have hereditary seats in the House of Lords, and thus take part in the government of the country. The mediæval republics of Venice, Genoa, and other places in Italy may be cited as examples of government solely by the patrician class.

ARISTODEMUS (731-724 B.C.), king of Messenia, whose history is intermingled with legend.

ARISTOGEITON, Athenian who joined with friend Harmodius (q.v.) in tyrannicide, 514 B.C.

ARISTOLOCHIA, genus of shrubs, some species being tropical lianas. *A. clematilis* (birth-wort) occurs in England. *A. siphio* (Dutchman's pipe), native U.S.A., cultivated in gardens as climber.

ARISTOMENES OF ANDANIA (fl. 660 B.C.), half-mythical hero of Second Messenian War; held Eira against Spartans eleven years; after its betrayal (c. 668 B.C.) A. went to Ialysus in Rhodes, where his son-in-law was king. One tradition says he died there; another represents him as slain in war by Spartans.

ARISTONICUS, Gk. grammarian, who lived at Rome during reigns of Augustus and his successor, and wrote a commentary on the text of Homer.

ARISTOPHANES (455-375 B.C.), the greatest comic poet of Greece; was an Athenian citizen; s. of ...us, a landowner, in Ægina. Upwards of fifty comedies are ascribed to A., but of these only eleven are extant: *The Acharnians* (425), *The Knights* (424), *The Clouds* (423), *The Wasps* (422), *The Peace* (421), *The Birds* (414), *The Lysistrata* (411), *The Thesmophoriazusæ* (411), *The Frogs* (405), *The Ecclesiazusæ* (393), and *The Plutus* (388). In politics the poet held conservative views and was strongly antagonistic to the democratic school of thinkers represented by Socrates and Euripides. His plays were often made the medium of his opinions, and through them he gave expression to his brilliant powers of wit, humour, and invective. His plays are further distinguished by originality of plot, cleverly planned situations, and graceful and vigorous dialogue, while it is held by some distinguished critics that the poet achieved his highest success in the exquisite lyrics which are interspersed through them. A. is ranked with Shakespeare and Molière as one of the great comic dramatists of the world, whose humour can never become stale, and whose interpretation of human nature, and the virtues and follies of mankind, is not for their own age alone, but for all time.

Eng. trans. by W. J. Hickie, J. Hookham Frere, and B. B. Rogers; *Aristophanes*, by Collins.

ARISTOPHANES OF BYZANTIUM (c. 257-185 B.C.), Gk. critic and grammarian; became chief of Alexandrine Library; edit. Hesiod, Plato's *Dialogues*, and Aristotle's *Nature of Animals*.

ARISTOTLE (384-322 B.C.), one of the greatest thinkers of history; b. Stagira, Macedonia, whence known as the *Stagirite*. Losing both parents while still young, A. came to Athens, where he joined Plato's school; stayed in Athens twenty years; on death of Plato, migrated to Atarnens in Mysia, where he married Pytheas, the adopted dau. of Prince Hermias. In 342 A. became tutor to Alexander, afterwards the famous general. Returning, in 335 B.C., to Athens, he taught philosophy in the walks of the Lyceum (whence the name *Peripatetics* (q.v.) given to his followers); accused of impiety, he withdrew to Chalcis in Euboea, where he died.

The writings of A., which are almost wholly the MSS. of lectures posthumously edit. by pupils, deal with almost all the branches of knowledge known to his age, and give a sketch of a complete system of the sciences. These are classed as theoretical (logic, metaphysics, and physics), practical (ethics, economics, politics), and productive (rhetoric and poetry).

Logic is regarded by A. as not properly a branch of philosophy, but as a study of method. His logical treatises were called the *Organon*, or *Instrument*, by the Peripatetics. He first deals with the ten categories—Substance, Quantity, Quality, Relation, Action, Passion, Where, When, Posture, Habit—a classification of the possible predicates of any subject; the highest classes in which all our ideas may be included. He then explains the combination of words into propositions, with definition and division. The 'analytic books' treat of the syllogism, deduction, and proof. The syllogism (q.v.) is the deduction of one judgment from two others, a connection being found in the middle term. Inference requires that these two premises should be already known, yet behind them lie the ultimate grounds of things, which cannot be proved by deduction, but are to be reached by 'induction.' This, taking an opposite course from deduction, starts from numerous sense experiences, and, apprehending the universal as a fact, leads to scientific knowledge. A lesser degree of certainty is reached in a 'dialectical' induction from expressed opinions.

The *metaphysics*, or 'first philosophy' of A. was so called by his followers from the position of these writings after 'the physics' (*μετὰ τὰ φυσικά*). *Metaphysics* deals with being, as being; with the ultimate conditions of existence. What is the Real, or true Substance? Plato's doctrine that the ideal alone is real is defective, as not explaining the unceasing change of nature, or how ideas, held to be the essence of things, can exist apart from them. Yet a materialistic theory is equally untenable; matter can have no existence apart from the form (*εἶδος*, the entire sum of its properties). Reality is then the concrete individual thing, containing elements which may be distinguished in thought, but have no separate existence. Hence the antithesis of matter (*ὕλη*) and form (*εἶδος*). Though these are the ultimate elements of being, yet all things, produced by art or nature, have four causes—Matter, Form, Efficient Cause, Final Cause. Matter is a mere capacity for existence (*δύναμις*); form, the essence of things, which with matter constitutes matter as we find it; the efficient cause is that which raises the mere capacity into actual existence, acting from within in plants and animals, or from without, as when an artist gives to his material the shape he has already in his mind; the final cause is the purpose which effects this passage from capacity to actuality (*ἐνέργεια*). These four are reduced to two, matter and form—*δύναμις* and *ἐνέργεια*, an antithesis really the same as the first of *ὕλη* and *εἶδος*, but dynamical and progressive instead of fixed and stationary.

The *theology* completes the metaphysics. God is the one perfect Being in which all possibility is at the same time actuality; the one self-existent essence, the cause of everything that exists, since nothing can exist without some precedent reality as moving cause.

Physics is called by Aristotle 'second philosophy,' and considers existence so far as in motion; actual, sensible reality. The universal conditions of all nature are space, time, motion (energy, entelechy, realisation of the potential). In nature is found a series of bodies extending from the inorganic up to man. Movement is produced by the soul, the principle of life. In plants, this is merely nutritive, in animals, also sentient, and in man rational; the human soul has all three functions, and the division expresses stages in its development. Sense perception is the apprehension of the forms of outward objects; not only passive, but active, distinguishing qualities by means

of one special sense, or several in combination (common sense). In this common sense, the five special senses have their unity, and lead to the development of imagination and memory. Reason belongs to man alone, and has a practical function in distinguishing things as agreeable or disagreeable. Unlike the nutritive and sentient parts of the soul, it is separable from the body, and immortal.

A's moral philosophy is included in the *Ethics* and *Politics*, which are to be taken as complementary works, dealing with the 'philosophy of human affairs' from different standpoints. In the *Ethics* is discussed the formation of individual character, taking the individual not in isolation, but as a social and political being. The knowledge thus acquired, however, is mere theory; it is through the State, operating through Law, that the best and happiest life is possible (*Politics*).

Ethics investigates the supreme good at which the individual aims in all his actions. This is Happiness, which consists, not in bodily pleasure, ambition, or speculative study, but in an active life in conformity with reason. Such a life is possible through the attaining of virtue, for which is necessary a thorough and systematic training. Virtue is thus not constituted by knowledge alone, as Socrates affirms; it cannot be taught, but requires an antecedent practical training. Hence the concern of politicians is to 'ethicise' the citizens, to make them virtuous. A virtue is an excellence or perfection of any natural aptitude of the soul, attained through practice; a moral virtue is an excellence of that part of the rational soul which involves the regulation of capricious instincts and feelings within us. Taken together, the moral virtues constitute character. Moral virtues are mediocrities, acquired by repeating the same action many times; in excess, or in defect, they lead to vices. Thus courage is intermediate between cowardice and rashness, temperance between insensibility and intemperance, liberality between avarice and prodigality. This is the *Doctrine of the Mean*; virtue not opposite from vice (Plato), but a mean between extremes. Virtue and vice, also, are voluntary and in our power. What of pleasure? This is a concomitant of perfect activity; itself good, and a necessary part of the best life.

The production through the State of the virtuous life of the citizen, is discussed in the *Politics*. The best State is, generally speaking, of a moderate size, and well placed towards land and sea, excludes from government all engaged in trade and commerce, makes provision for religious worship and moral training, with law as the outward expression of the moral ideal. The best governments are, in order, Monarchy, Aristocracy, Constitutional Republic, Democracy, Oligarchy, Tyranny. The citizens are a small minority in the State; relieved from laborious money-getting employments, spending their whole time in the pursuit of virtue, subjected from infancy to a severe and systematic training, admitting neither of luxury or self-indulgence.

The productive sciences apply true reasoning from appropriate principles to the production of a desired practical result. All the arts are both rational and productive.

In his *Rhetoric* A. handles the art of persuasion with that touch of the master-mind which gives finality to the subject; while in his fragment of the *Poetics*, dealing with the subject of tragedy, his pronouncements (e.g. on the 'Unities') have largely influenced all later literary criticism.

Zeller, *A. and Earlier Peripatetics* (1897); Butcher, *A.'s Theory of Poetry and Fine Art* (1895); Taylor, *Aristotle* (1912).

ARISTOTLE'S LANTERN, see ECHINODERMATA.

ARISTOXENUS (IV. cent. B.C.), Gk. philosopher and writer on music; a pupil of Aristotle; author of several hundred works, of which only three books of his *Elements of Harmony* have been preserved.

ARITHMETIC, the science treating of numbers and calculations. Numbers are expressed by means of certain signs or symbols. These are, in the very great majority of cases, figures; occasionally the capital letters I, V, X, L, C, D, M are used. Calculations are always made with figures. The basis of all calculation is the unit 1, one. A number is a unit, such as one penny, or a collection of units of the same kind, as seven horses. A number, such as four or five, not attached to any particular things or units, is called an abstract number. A number of particular units, such as four pigs or five geese, is called a concrete number.

Figures, or digits, 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, represent respectively *nought*, *one*, *two*, *three*, *four*, *five*, *six*, *seven*, *eight*, *nine* units. Each denotes one unit more than the preceding one.

The letters used to denote numbers are: M, a thousand; D, five hundred; C, one hundred; L, fifty; X, ten; V, five; and I, one. Since we have only the figures 0, 1, 2, etc., to represent all numbers, it is necessary to give a *place value* to the digits—that is, to make the value of a digit depend upon position as well as upon the symbol. The method was known in Europe to some extent about the XII. cent., and it is fairly certain that one of its avenues of approach was through the Moors.

A figure in the first place (i.e. the right-hand place) of a number denotes so many units. The same figure in the second place denotes 10 times as many. Hence, figures in the second place are often called *tens*. The same relation holds for all successive places, the *place value* of any one place being 10 times that of the one immediately to the right of it.

Each place has a place name, which corresponds with its place value; thus the digit 1 in the successive places from right to left denotes one unit, ten, one hundred, one thousand, ten thousand, one hundred thousand, one million, and so on up to one million million, which is called one billion, and to one million billion, called one trillion. In France and the United States a billion denotes a thousand million, a trillion a thousand billion, and so on.

The number 10, which is so important in our system of numeration, is called the *radix* or the *scale of notation*. Other systems with different *radices* have been employed, but no corresponding notation exists.

For further information on systems of notation, see NUMERAL.

(1) **Addition and Subtraction.**—*Addition* is the process of finding a single number equivalent to two or more numbers; *subtraction* is the operation of finding how much larger or smaller one quantity is than another. Addition is denoted by the sign + (plus), subtraction by - (minus), the left-hand one of two quantities being taken first and the next added to, or subtracted from, it. Thus 12 - 5 means we are to take 5 from 12.

Addition or subtraction usually involve rearrangement. Only quantities of the same kind can be added or subtracted. Thus, before we can perform the operation, 2 shillings - 6 pence, we have first to rearrange the 2 shillings as 1 shilling and 12 pence, when we can subtract the 6 from the 12, leaving 1 shilling and 6 pence.

Subtraction may be performed in one of two ways, based on (i) What must be added to a given number to make another? or (ii) By how much must a given number be diminished so as to equal another?

(2) **Multiplication** is a contracted form of addition, and is denoted by the sign x. The result is known as the *product*. In multiplication it is better to deal with the left-hand digits first, as these are the most important. The development of physical science has emphasised the impossibility of ever obtaining absolute accuracy, so approximations are all we are ever justified in obtaining. It is just as easy to perform the ordinary process of long multiplication from left to right as from right to left, and the facility thus obtained is of considerable value when contracted methods of multiplication of decimals are reached. Multiplication is performed

with the aid of multiple tables giving successive multiples of a particular unit.

(3) **Division**, denoted by the sign \div , is the operation of ascertaining how often one quantity is contained in another. A concrete quantity may be divided by another like quantity—as how often is 5s. contained in 15s.? A concrete quantity may be divided by an abstract number—as find the fourth part of 12d.; or an abstract quantity may be divided by another. In any case the result is known as the *quotient*.

(4) **Factors**.—The factors of any number are such numbers as are integral parts of the number, no remainder being left on division. A number which has no factor other than itself and unity is called a *prime number*. The first few primes are 2, 3, 5, 7, 11. A knowledge of the prime factors of numbers is of much use in the processes of finding the *Least Common Multiple* and *Highest Common Factor* of several numbers; e.g.:—

$$\begin{aligned} 24 &= 2^3 \times 3 & \therefore \text{L.C.M. of } 24, 15, 36 &= 2^3 \times 3^2 \times 5 \\ 15 &= 3 \times 5 & \text{and H.C.F.} &= 3; \\ 36 &= 2^2 \times 3^2 & \text{where } 3^2 \text{ denotes } 3 \times 3 \times 3 & \\ & & \text{and generally } a^n &= a \times a \times a \dots \text{to } n \text{ factors;} \end{aligned}$$

for the L.C.M. is the product of the highest powers of all the primes which occur, and the H.C.F. is the product of all factors common to the set of numbers.

(5) **Fractions and Decimals**.—A quantity being divided into any number of equal parts, one or more of such parts is a *fraction* of that quantity. Thus $\frac{1}{16}$ of 1 owt. denotes that 1 owt. is to be divided into 16 equal parts, and 3 of these taken. A fraction of a fraction is obtained from the principle that the value of a fraction is unchanged when both numerator and denominator are multiplied or divided by the same number. Thus to find $\frac{5}{4} \times \frac{7}{8}$ of X, we have $\frac{7}{8}$ of X = $\frac{4 \times 7}{4 \times 8}$ of X, and taking

as a new unit $\frac{7}{4 \times 8}$ of X, 4 times which is $\frac{7}{8}$ of X, we see

that this must be taken 5 times instead of 4, giving the result $\frac{5 \times 7}{4 \times 8}$ of X = $\frac{35}{32}$ of X. Addition and subtraction

of fractions is performed by reducing them all to a *common denominator*; it is usual to take for this the L.C.M. of the denominators.

In the *decimal notation* the system of place value is extended beyond the units figure. Thus 5.104 means 5 units, 1 tenth, 6 hundredths, 4 thousandths, or 5 + $\frac{104}{1000}$. The manipulation of decimals is thus exactly the same as for ordinary integral numbers, only the position of the decimal point giving difficulty. Multiplications and divisions are best performed by the contracted methods, the position of the decimal point being afterwards fixed by a rough approximation.

(6) **Approximation**.—For most purposes the numbers used in arithmetic are expressed with sufficient accuracy by approximations, which may be correct to a certain number of significant figures (the significant figures of a number are those commencing with the first figure other than zero). For example, all numbers representing the results of physical determinations are necessarily limited by the inaccuracy of our measurements, so it is futile to extend calculations beyond a certain point depending on the accuracy with which the measurements have been made.

(7) **Percentages** may be regarded as decimal fractions, the denominator in every case being 100. Thus $\frac{1}{4}$ is equivalent to $\frac{1}{4} \times 100$ or 75%. In many cases only approximate values can be given, as $\frac{1}{4} = .671428 \dots$ = approximately 67%. But by using mixed fractions we may write $\frac{1}{4} = 57\frac{1}{2}\% = 57\frac{1}{2}$.

(8) **Ratio** is concerned with the relative magnitude of quantities. *Proportion* deals with equality of ratios.

(9) **Special Applications**.—For information on Interest and Discount, etc., reference should be made to any text-book on commercial arithmetic.

Short History of Mathematics, W. W. R. Ball; *Teaching of Mathematics in Elementary and Secondary Schools*, J. W. A. Young; *Easy Mathematics, Chiefly Arithmetic*, Sir O. Lodge. **ELEMENTARY TEXT-BOOKS:** *School Arithmetic*, Hall and Stevens; *New School Arithmetic*, C. Pindlebury.

ARIUS (d. 336), famous heresiarch; presbyter of Alexandria; from him Arian controversy took its name, though doctrines he promulgated were not entirely new, being similar to those of Lucian of Antioch and Paul of Samosata. According to A., the Son was a created being, hence not in orthodox sense 'perfect God'; the Logos was united with a human body, hence Christ's humanity was 'not real either. A. was excommunicated, 325, at Council of Nicaea; his heresy lived on till VII. cent.

ARIZONA (31° 20' to 37° N., 109° 3' to 114° 45' W.), state, U.S.A.; bounded N. by Nevada and Utah, E. by New Mexico, S. by Mexico, W. by California and Nevada; area, 113,020 sq. miles. In N.E. is high plateau, in S.W. low-lying plains; has many short mountain ranges; highest points, Thomas Peak, Ord Peak. Chief rivers are Colorado (lower part navigable) and its tributary Gila; former crosses N.E. and turning S. forms part of W. boundary; latter drains S. Climate varies, hottest in S.; rainfall slight. Animals found are coyotes, prairie dogs, kangaroo rats, etc. Flora includes cacti, fir, juniper.

In 1848 northern A. as part of New Mexico became property of U.S.A. by treaty of Guadalupe-Hidalgo; southern part bought, 1854; separated from New Mexico, and organised as distinct territory, 1863; admitted as separate State to Union, Feb. 1912; capital, Phoenix. A. has Legislative Council of 12, and House of Representatives of 24, elected by popular vote for two years; sends two delegates to Congress.

Principal religious bodies: Roman Catholics, Latter-Day Saints, Presbyterians. Education is compulsory. Tucson has univ.

Cattle, sheep, horses, and pigs are raised; chief crops, alfalfa, wheat, barley; potatoes and apples grow in N., figs, grapes, etc., in S. Minerals include copper, lead, gold, silver, asbestos, quicksilver, zinc; granite, sandstone, limestone. Industries include copper-refining, car construction, timber-working, flour-milling.

Pop. (1910) 204,354, including about 26,000 Indians and 15,000 Mexicans. Map, see CALIFORNIA.

H. H. Banoroff, *History of Arizona and New Mexico* (San Francisco, 1887).

ARE (Lat. area), in Old Testament the bulrush basket in which the child Moses was found; Noah's ark (300 cubits long, 50 broad, 30 high); also 'Ark of the Covenant,' the sacred chest (containing the tables of stone, etc.) carried by the Israelites into Palestine.

ARKANSAS (35° 15' N., 93° 10' W.), river, U.S.A., partly navigable; rises in Rocky Mountains, Colorado; waters Kansas, Oklahoma, Arkansas; joins Mississippi; drains about 185,600 sq. miles; chief tributary, Canadian R.; length about 2150 miles.

ARKANSAS (33° to 36° 30' N., 89° 40' to 94° 41' W.), state, U.S.A.; bounded N. by Missouri, E. by Mississippi, S. by Louisiana, W. by Texas and Oklahoma; area, 53,850 sq. miles. Chief mts. are Boston range in N., Ouachita in S. Through centre flows A. River, other important streams being Ouachita, White, Bartholomew, and Red Rivers. Climate is healthy except in E., where swamps cause malaria.

Original inhabitants were Indian tribes; first European settlers French. A. formed part of Louisiana till 1812; of Missouri, 1812-19; organised as separate territory, 1819; became State, 1836.

Legislative powers are vested in Senate of 36 and House of Representatives of 100 members—former elected for four, latter for two years; sends two senators and seven representatives to Congress. Gov. holds office for two years. There is supreme court of judicature of five members, and several circuit courts. Baptist and Methodist churches predominate. State

system of education; separate schools for white and black.

A. is an agricultural State; chief crops, wheat, maize, oats, potatoes, hay, forage; crops in N., cotton, tobacco in S. In N.W. many fruits are grown, including apples, peaches, strawberries. Horses, mules, cattle, sheep, and pigs are raised. Forests cover nearly 2,000,000 acres, trees including cotton-wood, hickory, red cedar; timber-working is important industry. Coal is largely produced; other minerals include manganese, bauxite, lead, whetstones, granite, limestone. Industries include cotton-ginning, flour-milling. Capital, Little Rock; port for foreign trade, New Orleans. Pop. (1910) 1,574,449, over 25 % being negroes.

ARKANSAS CITY (37° 5' N., 97° 20' W.), town, Kansas, U.S.A. Pop. (1910) 7508.

ARKHANGELSK, see **ARCHANGEL**.

ARKLOW (52° 48' N., 6° 10' W.), port, Wicklow, Ireland. Pop. 5000.

ARKWRIGHT, SIR RICHARD (1732-92), Eng. inventor; b. Preston; apprenticed to barber, but took great interest in machinery used in the manufacture of cotton cloth; invented the spinning-frame, and made other improvements in processes of carding and spinning. With help of two wealthy partners he established mills at Nottingham, and at Cromford (Derbyshire), and amassed large fortune; knighted by George III. in 1786.

ARLBERG PASS (47° 8' N., 10° 10' E.), pass in Austrian Alps.

ARLES (43° 40' N., 4° 38' E.), river port, on Rhône, France; has ruined Rom. amphitheatre, and theatre where *Vénus d'Arles* was discovered; fine cathedral; various synods held here from 314 A.D. onwards. Pop. 16,200. Arles, Kingdom of, dated from 933 till about 1378, when its independent history ended; included Lyonnais, Franche Comté, and district between Rhône and Alps.

ARLINGTON (42° 24' N., 71° 9' W.), town, Massachusetts, U.S.A. Pop. (1910) 11,187.

ARLINGTON, HENRY BENNET, EARL OF (1618-85), Eng. statesman; sec. to Lord Digby (1643); member of Cabal (q.v.); fought for king during Civil War; knighted (1657); Charles' agent in Madrid till after Restoration. He became Sec. of State (1662); Baron A. (1663); Postmaster-General (1667); intimately connected with Dover Secret Treaty (1670); earl (1672); Lord Chamberlain (1674); Lord Lieutenant of Suffolk (1681). Agreeable but egotistical. A. was a typical Restoration statesman.

ARLON (49° 42' N., 8° 49' E.), town, Luxembourg, Belgium. Pop. (1900) 10,044.

ARMADA, THE (1588), fleet sent against England by Philip II. The commander (Duke of Medina Sidonia), was inexperienced; ships unwieldy and undermanned; gunnery inferior; and the provisions scanty. Eng. fleet, planned with view to naval battle, under Admiral Howard (Drake, Frobisher, Hawkins—subordinate admirals), finally routed the Spaniards; destruction completed by storms. Failure of A. represented Philip II.'s failure to make Roman Catholicism and Hapsburg dynasty supreme.

ARMADILLO, family of Central and S. American edentate, omnivorous, chiefly nocturnal mammals, provided with armour of bony plates and strong claws for burrowing; length up to 4 ft.; fossil species, some of immense size, found in caves. See **EDENTATA**.

ARMAGEDDON (or Harmagedon), the battlefield of the Apocalypse, where the final struggle between good and evil is to be determined on the Day of Judgment.

ARMAGH (54° 16' N., 6° 35' W.), county, Ulster, Ireland; area, 312,658 acres; rises to height of about 1900 ft. in S. (Slieve Gullion), but is elsewhere flat with good deal of bog; has good railway communications; linen and cotton-weaving; chief rivers, Bann, Blackwater, Newry, Callan. Pop. (1911) 119,600.

ARMAGH (54° 20' N., 6° 40' W.), cathedral town and ecclesiastical metropolis, Ireland; seat of Anglican and R.C. abps. Pop. 7600.

ARMAGNAC (43° 30' N., 0° 30' E.), old province, France; soil fertile; wine, brandy. Counts of A. were rivals of dukes of Burgundy, with whom joined forces against England, 1415; family extinct, 1497; countyship united to Fr. crown, 1607.

ARMAMENT, general preparations, offensive and defensive, for war; term thus includes not only arms and armour, but broadly armies and navies, naval bases and strategical arrangements.

Arms include any sort of offensive and (strictly, in the case of persons only) defensive weapon. Offensive weapons include arms to discharge missiles, e.g. catapults, firearms; missiles, e.g. spears; arms wielded by hand at close quarters for cleaving, thrusting, crushing, cutting, e.g. axes, daggers, clubs, sabres. Arms for purpose of defence comprise chain mail and metal plates to protect the body, head, and limbs, in addition to shields. Early races used stone weapons; those employed in the earliest (Palæolithic) times were chipped flints and celts, while in later (Neolithic) times more elaborate weapons were used, such as flint knives attached to handles. Various kinds of stone, horn, and bone were used for making weapons, spear-heads and arrow-points (leaf-shaped, lozenge-shaped, tanged, and triangular) were chipped in flint, and vegetable-fibre and bitumen fastened heads to shafts. Flint daggers (usually 12 in. long), were various in form and size. Short, leaf-shaped daggers and curved knives, with both edges sharpened, were highest type. Sling-stones and stone-balls (probably used like S. American *bolas*) were also used. Wristlets or braces of slate seem to have been only form of defensive armour in Stone age.

Metal was only gradually adopted for weapons; bronze dagger apparently earliest metal weapon. A sword with a long tapering blade and a long handle was a favourite weapon of the Bronze age. Swords of transition period between Bronze and Iron ages—generally iron copies of leaf-shaped sword, sometimes having flat bronze handle-plate. The problem of pre-Homeric and Homeric armour is largely a matter of inference; no single type of weapon predominates. According to Homeric poems, fully armed Homeric warrior wore shield, greaves, band, belt, tunic, helmet, breastplate, sword. Hoplites of later Greece wore helmet, breast- and back-plates, greaves of pliant bronze, round or oval shields, and fought with pikes and short double-edged sword. The heavy-armed cavalry carried lances. Between heavy- and light-armed were the peltasts (*pelta*—small light shield).

Equipment of Roman soldier underwent many changes. Early Roman sword was of bronze, straight blade, double-edged, obtusely-pointed. About Polybius' time (160 B.C.), the cavalry, originally protected by light ox-hide shield and fragile spear, adopted Gk. equipment of buckler, breast-plate, and strong spear. Later the *pilum* (a form of javelin) became characteristic weapon of the heavy-armed. Auxiliaries used the *hasta* and *spatha*. Under the Empire, the heavy-armed apparently had helmet, cuirass, long-sword and dagger, pilum and scutum. Cavalry had broadsword, buckler, long thrusting-pole, and javelins.

The fully armed Eng. knight (XI. cent.) had helmet, hauberk, shield, sword, lance (or sometimes axe, mace, and bow). The long-bow and the arbalest, or cross-bow, were two of the most formidable weapons of the Middle Ages. The Eng. victories at Crécy, Poitiers, and Agincourt were chiefly due to the use of the former weapon, while the French favoured the latter, and it continued in use in their army until about 1530. Crécy was the first Eng. battle in which cannon were used. Plate armour appeared in XIV. cent. In XV. cent. surcoat and horseman's shield tended to disappear. The *arquebus* was invented in Spain in XVI. cent.; and was succeeded by the *musket*, a clumsy weapon, fired from a rest. These in turn

gave place to the wheel-lock gun, the percussion gun (first made in England, 1820), and subsequently the carbine and magazine rifle.—In naval arms the tendency has been to equip larger and larger ships with heavier and heavier guns. To-day 13.5 in. guns are being installed in the newest vessels.

Armour, Naval, generic term for the protective features of a modern warship, of which the most important part is the broadside a., since upon this depends the safety of her engines, boilers, magazines, etc. Amongst the earliest Brit. iron warships was the *Warrior* (1860); but for some time afterwards it was the practice to armour wooden ships with iron plates, 4½ in. in thickness. This iron sheathing was subsequently increased to 6 in., 9 in., 12 in., and even 24 in. The use of steel plates was introduced by Schneider (1876), and this led to the adoption of 'compound a.', i.e. steel surface on wrought-iron foundation plate, the combination being designed to render a projectile ineffective and yet preserve the plating intact. Compound a. was largely used from 1880–90, when further improvements were introduced (Harvey and Tresidder processes); and the use of nickel in steel plates was introduced by Schneider, 1889. Krupp's armour, first employed in 1897, now furnishes the chief protective element in warships. The steel used in this process has a high tensile strength, and contains nickel, chromium, and manganese. The *Dreadnought* type of warships are protected by Krupp plates, varying from 11 in. amidships to 6 in. and 4 in. at bow and stern, the heaviest plating being below the water-line, since if hulled by a projectile the vessel becomes more quickly disabled. See **ARMY**, **SEA POWER**, **ARTILLERY**, and **GUN**.

Brett's *Ancient Arms and Armour*; Hewitt's *Ancient Armour and Weapons in Europe*; Boutell's *Arms and Armour*. Brassey's *Naval Annual*; Herbert Russell's *ABC of the Royal Navy*, etc.

ARMATOLES (Klephtes), Greeks of northern mountains (Armatolia) who contributed heroic fighting force to War of Independence, 1821.

ARMATURE, revolving part of electro-motor or dynamo (q.v.).

ARMENIA (37° 30' to 40° 30' N., 37° to 45° 30' E.), district, W. Asia, divided between Turk. vilayets Erzerum and Diarbekir, Russ. government of Erivan, parts of Kars and Tiflis, and part of Persian province of Azerbaijan. Surface is series of pastoral plateaus from 3000 to 7000 ft. above sea-level; highest point, Mt. Ararat (17,212 ft.); drained by Euphrates, Kur, Aras, Tigris. Climate is severe; cold N. winds; valleys have vineyards and orchards, produce cotton, tobacco, maize, rice, hemp, flax. Minerals include copper, silver, lead, iron, arsenic, alum, rock salt.

History.—A. was in early times successively subject to Assyria, Media, Persia; conquered by Lucullus, 69 B.C.; divided between Rome and Persia, 387 A.D. In 632 country was united to Byzantine empire; subsequently came under caliphs, under whom was established Bagratid dynasty; seized by Seljukian Turks in XI. cent. After various vicissitudes A. was divided between Turkey and Persia in XVI. cent., Russia acquiring share in 1828. Later in XIX. cent. revolutionary societies were formed; result of movement was massacre of Armenians by Turks in 1894, and subsequently at various dates. These massacres, known as *Armenian Atrocities*, have from time to time formed subject of negotiations between Britain, Russia, and Turkey. Map, see **ASIA MINOR**. Number of Armenians, c. 3,000,000.

Gregor, *History of Armenia* (1897); Lynch, *Armenia* (1901).

Armenian Language and Literature.—The old Armenian language, which is the medium of the country's lit., belongs to the Indo-Germanic group, and somewhat resembles ancient Greek. This may perhaps be explained by the fact that after the conversion of the Armenians to Christianity (300 A.D.) Gk. language and lit. became objects of special study,

and at a somewhat later date use of the Gk. alphabet became general in western Armenia. The translation of the Bible was undertaken in V. cent. by St. Mesrob and Sahak the Great, and about same time translations were made of the Chronicle of Eusebius, St. Chrysostom's homilies, the Discourses of Philo, and other notable works. This literary language, however, is no longer a living tongue, and modern Armenian is divided into several dialects, and is marked by a considerable admixture of Turkish and Persian words.

Armenian Church.—Christianity penetrated Armenia from Syria, probably in early part of III. cent., but details are unknown. All is obscure till Gregory the Illuminator, the real founder of Armenian Christianity, began his work about 261, and baptized King Tiridates. The A. C. has always been national, and has several peculiarities. As regards doctrine, like the other Eastern Churches it rejects the *filioque*, asserting the Procession of the Holy Spirit from the Father only, not from the Father and the Son, and like the Coptic and Abyssinian Churches Armenians refuse to accept Chalcedonian definition of the person of Our Lord, saying they are Monophysite, admitting only one nature. In ritual they have still maintained pagan sacrifice of animals, which they practise on the great festivals. The A. C. as a whole did not admit the supremacy of the Roman See, but since the XIV. cent. there have been definitely organised Armenian Catholics, recognising the Pope.

The Key of Truth, and articles, etc., on the Armenian Church by F. C. Conybeare.

ARMENTIERES (50° 40' N., 2° 50' E.), town, Nord, France. Pop. 29,400.

ARMET, a helmet much in use in the XVI. cent. with protection for the neck. A defensive ridge ran across the top from front to back; and it might be worn with or without the beaver.

ARMFELT, GUSTAF MAURITZ, COUNT (1757–1814), Swed. diplomatist, ambassador, and general; b. Finland; supported the Gustavians; exiled (1811) after deposition of Gustavus IV.; first Gov.-Gen. of Finland.

ARMIDA, heroine of Tasso's *Jerusalem Delivered*; exercised magical fascination over heroes of Crusades.

ARMIDALE (30° 26' S., 151° 40' E.), town, New South Wales. Pop. 4200.

ARMILLARY SPHERE, astronomical instrument, consisting of rings, representing horizon, meridian, ecliptic, equator, and other imaginary circles; formerly used to demonstrate position of celestial bodies.

ARMINIUS, HERMANN (17 B.C.–21 A.D.), Ger. national hero, who led the tribes and won victory over Roman gov. Quintilius Varus, in Teutoburger Wald, and later over Germanicus Caesar; eventually murdered by his relations, who became jealous of his power.

ARMINIUS, JACOBUS (1560–1609), Dutch religious leader; studied at Leiden Univ., 1576–82, where he met various able theologians; then at Geneva, Basel, and in Italy. Broad-minded and tolerant, he was too friendly with 'heretics' to satisfy the stern Calvinists of his day; was ordained, 1588; theological prof. at Leiden, 1603–9. His name has passed to the type of theol. which is anti-Calvinistic; Calvin maintained predestination, A. man's freedom—every man could be regenerated and saved if he would. *Life*, by Brandt.

ARMITAGE, EDWARD (1817–96), Eng. historical painter; ed. chiefly abroad, and commenced career in Paris; much success in competitions for cartoons and frescoes for new Houses of Parliament, 1843 and later. 'Samson' and various Crimean scenes are good examples of his art.

ARMOIRE (Fr.), name given to large decorated cupboards, or wardrobes, for containing church vestments, eucharistic vessels, etc. Many fine examples are to be seen in old Fr. cathedrals.

ARMORIAL BEARINGS, originally, devices

placed on armour, especially shield, or coat worn over armour (from which arose term 'coats of arms'); later, shield which shows devices, and crest, coronet, motto, etc. Hereditary *insignia gentilitia* existed X. cent., but were not in common use till XIII. cent.; by royal proclamation, 1419, nobody whose ancestors did not bear arms at Agincourt may assume them without royal licence; all male descendants may bear them, female only in lozenge or under curtain.

ARMORICA, Roman name for Brittany.

ARMOUR, PHILIP DANFORTH (1832-1901), Amer. merchant and philanthropist; head of firm of Armour & Co., pork-packers, in which business he acquired a vast fortune; founded, in Chicago, Armour Institute of Technology, and Armour Flats to provide workmen with good dwellings at low rentals.

ARMS, see **ARMORIAL BEARINGS**.

ARMSTEAD, HENRY HUGH (1828-1905), Eng. sculptor; executed much of the external decoration of the Colonial Office, Whitehall; the fountain at King's Coll., Cambridge; and numerous statues; A.R.A., 1875; R.A., 1880.

ARMSTRONG, ARCHIE (d. 1672), Eng. jester; after obtaining notoriety as an Eskdale sheepstealer, he entered service of King James I., and rose to be Court fool, continuing in that office during some part of the reign of Charles I. Asked to say grace at Whitehall when Laud was present, he uttered the famous words: 'Let great praise be given to God, and little *laud* to the devil.' He was subsequently dismissed the Court, set up as a moneylender in London, and, having acquired a comfortable fortune, retired to his Cumberland estate. (Scott's *Fortunes of Nigel*.)

ARMSTRONG, JOHN (1709-79), Scot. author and physician; settled in London and was intimate with John Wilkes; author of a didactic poem, *The Art of Preserving Health*, and numerous other writings in prose and verse.

ARMSTRONG, SAMUEL CHAPMAN (1839-93), Amer. soldier and educationist; did much to promote negro education.

ARMSTRONG, WILLIAM GEORGE ARMSTRONG, BARON (1810-1900), Eng. ordnance inventor; founder of Elswick manufacturing works; b. Newcastle; invented improved rotary water-motor (1839), hydraulic crane (1846), and 'accumulator' (1850); app. Engineer of Rifled Ordnance, and knighted (1859); made a peer (1887).

ARMY.—The term army in its widest sense signifies the force available to conduct operations against an enemy on land, and therefore includes men, horses, weapons, and other material of war—e.g. the French army. In a more restricted sense an army is any military force acting independently—e.g. Wellington's army. The word is also used for legal and administrative purposes in various senses—e.g. the Indian Army, Regular Army.

On looking backwards we find that an army has been always a reflection of the state of society or the stage of civilisation which called it into being. An army has no inherent vitality, no germ of development. It flowers only to decay. In the earliest ages tribes of shepherds took up arms and laid them aside again, becoming a nation at peace or a nation at war under the leadership of their chiefs. In countries where the population was agricultural, some division of labour became necessary, since each tribe on taking the field was compelled to leave behind some men to sow and reap. Later still, when artificers had settled in towns, the trade of a soldier became specialised, and yet the army remained practically a militia inasmuch as the character of the civilian predominated over that of the soldier, and troops could not be carried into distant countries for long periods without danger of mutiny.

The first armies of which we have any definite knowledge are those which fought at *Marathon* (490 B.C.), where Greek and Persian met. The Persian army of bowmen had reached some degree of perfection under

Cyrus and his successor, Darius, but the Athenian spearmen under Miltiades won the victory; yet the Persians had overcome bowmen like the Medes, the Lydian lancers, and armoured hosts like the Babylonians, Egyptians, and Greeks, and we must therefore attribute the Athenian victory at *Marathon* to superior leadership. The seeming phenomenon that an army will grow and diminish, prove irresistible, and decline again, within a century, is accounted for by considering an army as the creation of a general with a genius for war, or as the instrument of a feeble ruler. Three Roman legions were exterminated by a German militia raised by Arminius; the armies of Sparta and other Greek republics could not withstand a force trained by Philip of Macedon and his son, Alexander the Great. The armies of Persia, of Carthage, of Macedon, and of Greece dwindled one by one as their leaders perished; the Roman army expired in its effort to check the Huns under Attila, who in the year 451 threatened to sweep away all trace of civilisation and Christianity in Western Europe. Since the time of Abderrahman, whom Charles Martel defeated at Tours in 732, we have seen no Oriental army capable of invading France.

In England, King Alfred (871 A.D.) raised a national army of militia to expel the Danes, but it proved unequal two centuries later under Harold to withstand the army of knights brought over by William of Normandy. Then came the feudal period when powerful nobles exacted military service from their dependents, and hired these forces out to support any cause they adopted—at one time aiding their king, at another time opposing the king's forces, or even, as in the Wars of the Roses (1455), destroying one another. But not until the XVI. cent. do we learn of an army fit to be compared with those of Greece and Rome. It was Philip II. of Spain who then incontestably bore the palm in respect of army and navy, but in the next cent. Gustavus Adolphus assumed the position which the death of Philip had left vacant, and became the military head of Europe, perfecting his army during the Thirty Years War. The Civil War in this country produced the formidable militia of the Commonwealth, which subsequently was replaced by the royal standing army. Meanwhile Gustavus Adolphus had yielded place in the military world to Louis XIV., whose army procured him all that Napoleon coveted at a later period, but the rise of the Duke of Marlborough proved fatal to the French army at the beginning of the XVIII. cent.

Modern Armies.—In the middle of the XVIII. cent. we find the modern army in embryo. Frederick the Great possessed about 50,000 Prussian infantry, cavalry, and artillery, an army which in the course of twenty years he developed to the highest pitch of excellence. He overcame the armies of France, Austria, and Russia in turn, and established a system of drill, discipline, and manoeuvre which ensured success in battle. But 'the soul of an army is the mind of a great commander,' and on Frederick's demise the Prussian army declined. Meanwhile with the French Revolution many of the characteristics of primitive warfare were reproduced in the French levies which fought at *Valmy* and *Jemappes*. The male population of France found occupation in the army when civil disturbance had virtually put an end to the pursuits of peace. Untrained and undisciplined, but filled with an energy and spirit of adventure hard to realise to-day, they overthrew the royal standing armies of Europe and carried the tricolour beyond the Alps. This weapon the Republican government placed in the hands of the world's greatest soldier. Napoleon, at *Austerlitz* and *Jena*, showed what was possible to an absolute ruler at the head of a large well-trained and well-equipped army; but his foes were not long in learning the lesson he had to teach them, and then the tide turned. After *Waterloo* the French army, as Europe had known it for twenty years, ceased to exist.

Compulsory Service.—Scharnhorst and other army leaders in Prussia now showed the advantages to be gained by a nation which, in regard to its army, was

independent of local and ephemeral opinion, by enacting laws under which the entire male population were subject to military service; and what is more, to rigid and continuous military training. Prussian commanders in the field were never again to fail for want of numbers of trained soldiers. Moreover the universal obligation to serve put a premium on military rank so that the profession of arms became one to which the élite of society naturally turned. A war school was established at Berlin out of which grew a great General Staff, which in turn produced men of the type of Moltke and Von Roon. Royal personages were bred to arms, and when in 1866 Prussia invaded Austria she had at the head of her armies the king and his two sons. Their easy victory over the Austrians at *Sadowa*, and four years later over the French at *Gravelotte* and *Sedan*, convinced the world that her methods were perfect; and from that time it has been the aim of every first-class continental power to model its national forces upon the Prussian army.

The basis of a modern army is the male population of military age (from seventeen to forty-five), the whole of which is in theory available for the purposes of war; but since the resources of no state would enable it to maintain in barracks even 50 per cent. of the male population, the system of enrolment provides that every year all young men of a certain age should submit themselves to the military authorities; but the financial and economic conditions of the country finally govern the numbers selected for service with the colours for a period of two or three years. Thus every year a large number of men complete their period of continuous training and return to civil life for recruits to fill their places, with the result that a very large proportion of the population are in fact ex-soldiers. The numbers actually serving with the colours in time of peace in any given year constitute the army's *peace strength*, and by adding to this number the numbers required to fill the cadres the *war strength* (part of each peace unit, not appearing in the firing line, is not reckoned in fighting strength) is obtained; and to keep the units at their mobilised strength as casualties occur a reservoir of trained reserves is necessary. Ultimately the question of population will dominate the theory of compulsory service in Germany, for one million men annually present themselves for training of whom only one-fourth can be taken for service with the colours.

Strength of Modern Armies.—*Infantry (Peace)* in thousands: Russia 580; Germany, 404; France, 379; Austria, 194; Italy, 167; Britain (Regulars only), 151; Japan, 149; United States (Regulars only), 27.

Cavalry (Peace) in thousands: Russia, 115; France, 75; Germany, 73; Austria, 47; Italy, 24; Britain, 20; United States, 13; Japan, 4.

Peace Strength totals in thousands: Russia, 1200; France, 634; Germany, 634; Austria, 327; Italy, 288; Britain, 255; Japan, 230; United States, 81.

FIGHTING STRENGTH ON MOBILISATION.

Rifles in thousands: Russia, 973; Germany, 633; France, 618; Austria, 420; Italy, 300; Japan, 228; Britain, 135; United States, 39.

Sabres in thousands: Russia, 111; Germany, 76; France, 66; Austria, 37; Italy, 20; Britain, 15; United States, 15; Japan, 14.

Guns: Russia, 4432; Germany, 3866; France, 2926; Austria, 1854; Italy, 1470; Britain, 1170; Japan, 954 (besides about 228 heavy guns); United States, 144.

Fully trained Reserves in thousands: Germany, 4000; Russia, 3800; France, 2300; Austria, 1600; Italy, 1250; Japan, 1000; Britain, 215.

Army Units.—The units of an army are termed battalions, regiments, batteries, companies, etc. The group of units under a general officer and his staff is called a formation, such as the brigade, the division, the army corps; the units are maintained at a peace establishment (*cadre*) corresponding to the sum available for

maintenance, which varies in different armies. The war establishment of units provides for the influx of reservists on mobilisation. The formation common to all armies is the *division*, which comprises all arms and branches of the service—viz. infantry, cavalry, artillery, engineers, signallers, besides what are called the services and departments for the supply of food, ammunition, and medical attendance. Britain and Japan have no higher organisation.

The United States has no 'formation' whatever; the s. is voluntary and recruits serve for three years. Each State has its own militia, subject at need to Federal authority, and in it every able-bodied man may be called to serve. The establishment has ever been small, and even in the war with Spain the s. did not reach a quarter of a million men, but they were conspicuous for initiative and resource. Officers are generally trained at West Point Military Academy.

The British Army is the most noticeable exception to the rule of universal service. The army system is a patchwork, exhibiting almost every known method of raising troops. In the Channel Islands, as in Jamaica and British Guiana, compulsory service is fully recognised, and every male inhabitant becomes liable for service in the militia. In the Isle of Man a local law permits the maintenance of volunteers, but rejects enlistment under the Territorial Forces Act. In Ireland men may be enlisted for the regular forces or for any form of militia service, but not as volunteers. In India volunteers are recruited from the European and Eurasian element, but not from the natives. The natives, however, may be enlisted as regular soldiers. On the frontiers a border militia has been established under feudal conditions.

In Bermuda volunteers are maintained, but in Malta the local forces are either regulars or militia. In West Africa the natives are enlisted as regular soldiers. The West Indies maintain a regiment of native regulars. In Great Britain every species of soldier exists except the conscript. There are regulars, militia (called the SPECIAL RESERVE), and volunteers (called the TERRITORIAL FORCES), besides certain hybrid organisations like the Honourable Artillery Company, the OFFICERS' TRAINING CORPS, and the NATIONAL RESERVE. Parliamentary prejudice against compulsory service is shared by the wealthy, who grant money and property for the support of the voluntary system, and so the cost of the military forces is colossal in comparison with the small numbers of trained men available. The argument is often used that owing to her insular position the navy is sufficient and no invasion need be feared.

It is further pointed out that Brit. overseas possessions demand garrisons of regular troops in peace time, and these troops could not be procured by any system of compulsion. On the other hand, it is urged that the navy cannot ensure the absolute inviolability of Brit. shores, and that an invasion could only be met by highly trained troops. Perhaps there would be less ground for self-reproach in the event of disaster if a conscript militia army were maintained for home defence, and the voluntary system relied on for a standing army for foreign service. With a conscript militia that degree of training could be ensured which military advisers prescribe, but no thoroughgoing system of universal service could well be applied to Britain's immense population, especially in view of the small accommodation available in barracks. It certainly ought not to be beyond the wit of man to devise a system based on the cadet system now established in Australia, by which every lad pays for his State education to the extent at least of fitting himself to bear arms in a modern army for home defence.

Jerram, *Armies of the World*; Fortescue, *History of Brit. Army*.

ARNALDUS DE VILLANUEVA (c. 1235-1313), Span. astrologer and alchemist; author of chemical and medical works.

ARNAUD, HENRI (1641-1721), Vaudois general

and pastor; untiring in efforts to secure restoration of his countrymen to their native valleys.

ARNAULD, ANTOINE (1600-1619), Fr. advocate; famed for diatribe against Jesuits (1594); f. of twenty children; six of his dau's became nuns at Port-Royal, while several of his sons were Jansenist theologians. His dau., **Angélique A.** (1624-84), was abbess of Port-Royal and wrote *Mémoires* of that place; his son, **Antoine A.** (1612-94), distinguished Jansenist theologian, was part-author of *Logique de Port-Royal*.

ARNAULT, ANTOINE VINCENT (1786-1834), Fr. dramatist and poet; his plays include *Germanicus* (1817) and *Blanche et Monicassin, ou les Vénitiens* (1798), but he is chiefly known for his short poems, *Fables et Poésies*, 1812.

ARNAUT (Arnaout), Turk. name for Albanians.

ARNDT, ERNST MORITZ (1769-1860), Ger. poet and patriot; prof. of History at Greifswald, and later at Bonn; famed for his *Was ist des Deutschen Vaterland?* and other patriotic songs.

ARNDT, JOHANN (1555-1621), Ger. Lutheran; wrote devotional works, *Wahres Christentum, Paradiesgärtlein*, etc.; specially admired by Ger. 'Pietists'.

ARNE, THOMAS AUGUSTINE (1710-78), Eng. composer; writer of numerous operas, oratorios, glees, and airs; musical director at Drury Lane, Covent Garden, and Vauxhall; Mus.Doc. Oxford (1759). Dr. A. is chiefly remembered for his settings of *Rule Britannia* and a number of Shakespeare's songs.

ARNETH, ALFRED, KNIGHT VON (1819-97), Austrian historian; was a prolific writer, his works including volumes on Prince Eugene of Savoy, Maria Theresa, Marie Antoinette, etc.

ARNHEM, ARNHEIM (51° 59' N., 5° 55' E.), town, Holland; formerly fortified; manufactures woollens, cottons, tobacco, soap, paper; in Groote Kerk is monument to Charles, Duke of Gelderland; fine public buildings; surroundings beautiful; twice stormed by French, who were driven from it by Prussians, 1813. Pop. (1910) 64,200.

ARNICA, European and N. Amer. genus of composite plants; tincture, used medicinally for sprains and bruises, prepared from *A. montana*.

ARNIM, ELISABETH VON (1785-1859), Ger. authoress; wife of Ludwig von Arnim; cherished hopeless passion for Goethe; pub. volumes of correspondence with him and other poets which were not wholly authentic.

ARNIM, HARRY KARL KURT EDUARD, COUNT VON (1824-81), Ger. diplomatist; Prussian envoy at papal court, 1864; Ger. envoy at Paris, 1871; sentenced to nine months' (afterwards five years') imprisonment for suspected treason with regard to State papers, 1874; escaped and d. abroad.

ARNIM, LUDWIG VON (1781-1831), Ger. novelist and poet; pub. collection of legends and ballads under title of *Des Knaben Wunderhorn* (1806-8); numerous hist. and other novels.

ARNIM-BOYTZENBURG, HANS GEORG VON (1581-1641), Ger. soldier and diplomatist; served with distinction in Polish, Swed., and Saxon armies.

ARNO (d. 821), abp. of Salzburg (Austria); promoted learning and Church reform.

ARNO (43° 50' N., 11° 40' E.), river, Italy; on it stand Florence and Pisa; enters Gulf of Genoa.

ARNOBIUS, Christian apologist and rhetorician in Diocletian's reign.

ARNOBIUS, THE YOUNGER (fl. V. cent.), Gallio Christian preacher; wrote commentary on Psalms.

ARNOLD, BENEDICT (1741-1801), Amer. soldier, b. Norwich, Connecticut; originally a shop-proprietor and trader, he co-operated in Montgomery's unsuccessful attack on Quebec, 1775; was commissioned brigadier-general, 1776; major-general, 1777. He distinguished himself in both battles of *Saratoga*, and received command of Philadelphia, 1778; reprimanded for alleged misconduct, 1780; plotted to betray West Point. On plot being discovered, A. escaped to Brit. lines, and became a brigadier-general in Brit. army.

ARNOLD OF BRESCIA (d. 1155), Ital. theologian; accused of heresy by St. Bernard; went to Rome, 1145; attacked clergy for having temporal possessions; compelled to flee to Campania; condemned and executed, 1155; religious rather than political enthusiast.

ARNOLD, SIR EDWIN (1832-1904), Eng. poet and journalist; won Newdigate Prize (1852) on subject of *Belshazzar's Feast*; was schoolmaster at Birmingham, principal of Sanskrit College, Poona, and, taking to journalism, eventually became editor of *Daily Telegraph*. His best known poem, *The Light of Asia* (1879), dealing with the life and teaching of Buddha, won wide popularity. Other volumes of poems are: *Indian Song of Songs* (1875); *Pearls of the Faith* (1883); *The Song Celestial* (1885); *With Sadi in the Garden* (1888); *Potiphar's Wife* (1892); and *Adzuma* (1893).

ARNOLD, GOTTFRIED (1666-1714), Ger. author; wrote numerous Prot. theological works.

ARNOLD, MATTHEW (1822-89), Eng. poet and critic; s. of Dr. Arnold of Rugby; ed. Rugby, Winchester, and Oxford; won Newdigate Prize (*Cromwell*), 1843; Fellow of Oriel, 1845; prof. of Poetry, Oxford, 1857-67; inspector of schools, 1861-86. His poetical works are: *The Strayed Reveller* (1849), and *Empedocles on Etna* (1852), both pub. under the initial 'A.'; and under his full name, *Poems* (1853); *Poems*, 2nd Series (1855); *Merope* (1858); *New Poems* (1867). Among his prose works are: *On Translating Homer* (1861-62); *Essays in Criticism* (2nd Series, 1865); *Study of Celtic Literature* (1867); *Essays in Celtic Literature* (1868); 2nd Series (1888); *Culture and Anarchy* (1869); *Friendship's Garland* (1871); *Literature and Dogma* (1873); *God and the Bible* (1875); *Last Essays on Church and Religion* (1877); *Mixed Essays* (1879); *Irish Essays* (1882); *Discourses in America* (1885). A. occupies a high place amongst the poets of the Victorian age, but his work is more remarkable for its finished workmanship than for inspiration. At the same time, his poetry is distinguished by a haunting and exquisite harmony, great clarity of thought and expression, and a sense of restfulness. A disciple of Wordsworth, he possessed a sense of proportion and a gift of humour (though it is not evident in his poetry) which saved him from the blunders of the Lake poet. As critic, A. is scarcely less eminent than as a poet, and his opinions, expressed in lucid and excellent prose, undoubtedly exercised a most stimulating influence on his time.

Monographs by Professor Saintsbury, 1899, and H. W. Paul, 1902; *Letters*, edit. by G. W. E. Russell, 1895.

ARNOLD, SAMUEL (1740-1802), Eng. composer; was organist of the Chapel Royal, and later of Westminster Abbey; composed numerous operas (including *The Maid of the Mill* and *Rosamond*), oratorios, and other musical pieces, and compiled a collection of Church music.

ARNOLD, THOMAS, D.D. (1795-1842), Eng. schoolmaster; head of Rugby School, 1828; prof. of Modern History at Oxford, 1841. His remarkable personality exercised a lasting influence over his pupils.

ARNOLD OF WINCKELRIED, Swiss patriot to whom victory of Sempach over Austrians, 1386, was due.

ARNOTT, NEIL (1788-1874), Scot. physician and physiologist; b. Aberdeen; author of works on natural sciences, and inventor of the water-bed, Arnott stove, Arnott ventilator, and other appliances.

ARNOTTO, American tree from which annatto (g.v.) is produced.

ARNOULD-PLESSY, JEANNE SYLVANIE (1819-97), Fr. actress; made her début at the Comédie Française in 1834, and quickly achieved a popularity second only to that of Mlle Mars; m. the dramatist, J. F. Arnould.

ARNSBERG (51° 24' N., 8° 4' E.), town, Prussia. Pop. 9200.

ARNSTADT (50° 50' N., 10° 54' E.), town, Schwartzburg-Sondershausen, Germany. Pop. 16,300.

ARNSWALDE (53° 8' N., 15° 24' E.), town, Prussia. Pop. 9000.

ARNULF (d. 899), Rom. emperor; famous soldier and churchman.

AROIDEÆ, order of monocotyledon plants with about 1000 species, the best known British representative being the lords-and-ladies or cuckoo-pint (*Arum maculatum*). Other species, herbaceous, shrub-like, or climbing, are inhabitants of the tropics, and can be cultivated in hothouses.

AROLSEN (51° 24' N., 9° 1' E.), town, Waldeck, Germany. Pop. (1905) 2800.

AROMATIC, name applied to organic compounds derived from the benzene nucleus or ring:—

AROMATICS, derivatives of anise, cloves, cinnamon, camphor, rosemary, and similar plants, of musk deer and civet cat; have fragrant smell and are almost all strongly antiseptic.

ARONA (45° 45' N., 8° 36' E.), town, Italy. Pop. 4700.

AROUET, family name of Voltaire (q.v.).

ARPAÐ (d. 907), founder of Hungarian dynasty of A., whose members ruled till 1301, assuming title king, 1001.

ARPI (41° 29' N., 15° 30' E.), ancient town, Italy; near Foggia.

ARPINO (41° 39' N., 13° 38' E.), town, Campania, Italy; birthplace of Cicero and Marius. Pop. 10,600.

ARQUA (45° 15' N., 11° 43' E.), village, Padua, Italy. Here Petrarch lived the last four years of his life, and d. in 1374. His house is still shown, and his tomb.

ARQUEBUS, a firearm of the XV. and XVI. cent's, being an improvement upon the *gonne*, or *hand-cannon*, of the Middle Ages. It was in use as far back as the reign of Richard III., but, towards the end of the XVI. cent., was displaced by the musket.

ARQUERITE, compound of silver and mercury (Ag₂Hg).

ARQUES-LA-BATAILLE (49° 55' N., 1° 9' E.), village, Seine Inférieure, France; old castle; Henry IV. defeated Duc de Mayenne, 1589.

ARRACK (RAK), see SPIRITS.

ARRAH (25° 33' N., 84° 38' E.), town, Bihar and Orissa, India. During the Mutiny a dozen British soldiers with fifty Sikhs held A. against 3000 Sepoys. Pop. 40,200.

ARRAIGNMENT, a 'true bill' having been found against a prisoner, he is brought into open court and 'arraigned,' i.e. the indictment is read over to him, and he is asked whether he pleads 'guilty' or 'not guilty.'

ARRAN (55° 35' N., 5° 15' W.), island, Firth of Clyde, Scotland; area, 165 sq. miles; chief villages, Brodick, Lamlash, Corrie, summer resorts; excellent fishing and game; surface mountainous, highest peak, Goatfell; rainfall heavy; cairns and stone circles occur; ruined castles are Loch Ranza and Kildonan; Brodick Castle belongs to dukes of Hamilton; produces oats, potatoes; exports cattle, fish, sheep, oats. Pop. (1911) 4628.

ARRAN, EARLDOM OF (1475-1529).—(1) JAMES HAMILTON, s. of James Lord Hamilton, and Mary, dau. of James II. of Scotland, was created Earl of Arran, 1503; commanded Scot. fleet against England, 1513; one of Lords of Regency, 1517; d. 1527, succ. by his eldest s., (2) JAMES HAMILTON, 2nd earl (1515-75); he vacillated in the religious quarrels of his time, accompanied James V. to France in 1536, was chosen Regent of Scotland, 1542, and in 1549 cr. Duc de Châtellerault in France; he latterly supported Mary's cause. (3) JAMES (1537-1609), s. of preceding,

became a strong Prot.; resigned earldom in favour of James Stewart.

ARRAS (50° 17' N., 2° 45' E.), cathedral town, Pas de Calais, France; has trade in corn and oil; manufactures agricultural implements, lace, hosiery; seat of bp.; fine public buildings; formerly famous for tapestries. Pop. 25,813.

ARRENOTOKOUS, biological term for females producing males parthenogenetically.

ARREST, an arrest is not usually made without the authority of a 'warrant,' which is a written order instructing an officer to bring the suspected person before a Court. Warrants are issued by the Privy Council, Judges of the High Court, Justices of the Peace, and Coroners, and generally by a judicial executive to an officer, the law in U.S.A. being similar to that of Gt. Britain. A constable can arrest without a warrant any one whom he suspects of having committed a felony, any one committing, or having committed, or being about to commit a breach of the peace, or any one doing wilful damage to property. A private person may arrest without warrant any one suspected of having committed a felony, provided a felony has been committed, any one whose freedom will lead to a breach of the peace, any one committing or about to commit treason, any one committing offences under the Vagrancy Act, and any one for whom he has become bail when he wishes to be relieved of liability.

ARRESTMENT, in Scots law, a process, or 'diligence' by which A, who is in debt to B, is prohibited from settling his account until the latter has satisfied a claim which C has against him.

ARRETUM (43° 38' N., 11° 55' E.), ancient town, Italy; modern Arezzo; has Rom. remains.

ARRHENIUS, SVANTE AUGUST (1859-), Swed. chemist and physicist; director of Physico-Chemical Department, Nobel Institute, near Stockholm; pub. researches on electrolysis and books on cosmic energy; Nobel Prize, 1903.

ARRIA, wife of Roman Cæcina Pætus, condemned to death, 42 A.D., as conspirator against Emperor Claudius; set her husband example of suicide.

ARRIAN, FLAVIUS (96-180 A.D.), Gk. historian and philosopher; b. Nicomedia, Bithynia; lived under Emperors Hadrian, Antoninus Pius, and Marcus Aurelius; pupil of Epictetus; wrote the standard history of Alexander the Great (*Anabasis of Alexander*), histories of Bithynia and Trajan's Wars, a work on India, and a treatise on the chase.

ARROL, SIR WILLIAM (1839-1913), head of engineering co. of William Arrol & Co.; builder of Tay and Forth Bridges.

ARRONDISSEMENT (Fr., from *arrondir*, to make round), division of Fr. department for purposes of administration; name given in 1800 to newly formed district of 1790.

ARROWROOT, edible starch obtained from root-tubers of a plant (*Maranta Arundinacea*) growing in W. Indies and the tropics generally; a valuable food for invalids.

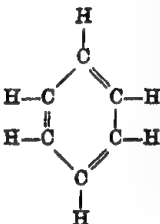
ARROWSMITH, AARON (1750-1823), Eng. geographer and publisher; produced a large chart of the world on Mercator's projection (1790). The business was continued by his sons, Aaron and Samuel, and his nephew, John, the latter of whom was one of the founders of the Royal Geographical Society. Other publications of the firm were the *Eton Comparative Atlas*, and (1834) the *London Atlas*.

ARSACES, family of Scythian chiefs whose empire was overthrown about 226 A.D.

ARS-AN-DER-MOSEL (49° 4' N., 6° 2' E.), town, Alsace-Lorraine, Germany. Pop. 3800.

ARSENAL, word of Arabic origin which occurs in many languages; used of a large store containing war equipment and ammunition.

ARSENIC (As=74.96), metalloid in nitrogen group; name, however, popularly applied to 'white arsenic,' arsenious oxide. Element occurs native, combined with metals, as sulphides, also in small



quantities in pyrites, coal, etc.; and is obtained as a sublimate by heating arsenical pyrites. A. is a steel-grey, metallic-looking, good conductor of heat and electricity; has S.G. 5.73; sublimes at 450° , vapour smells of garlic, molecule As_2 ; condenses to (i.) yellow and (ii.) mirror allotropes; burns to oxide As_2O_3 ; used for hardening lead shot. Hydride AsH_3 , gas, formed in Marsh's test, easily dissociates.

OXIDES AND DERIVATIVES.— As_2O_3 , octahedral, prismatic, and vitreous forms; slightly soluble in water, producing arsenious acid, H_3AsO_3 , a reducing agent. Arsenites: Na_2AsO_3 , Ag_3AsO_3 (yellow precipitate), $CuHASO_3$ (Scheele's green); $AsCl_3$, liquid, B.P. $130^{\circ}C$; As_2O_3 , deliquesces, forming arsenic acid, H_3AsO_4 .—Arsenates: $Na_2HASO_4 + 12H_2O$ and Ag_3AsO_4 (brown) [ortho]; $Na_3As_2O_7$ [pyro]; $NaAsO_3$ [meta]. As_2S_3 (realgar), As_2S_5 (orpiment), and As_2S_5 , yellow precipitates.

ARSENIOUS (d. 450), a Roman anchorite who was sometime tutor to the children of Theodosius the Great; spent his last forty years as a recluse in Egypt, where he won general admiration for sanctity of life.

ARSENIOUS ANTORIANUS, patriarch of Constantinople during latter part of XIII. cent.; wrote *Synopsis Canonum*.

ARSENOLITE, arsenious oxide, generally white (As_2O_3).

ARSINOË, name of several Egyptian queens. Best known A. (d. 271 B.C.), dau. of Ptolemy I., sister and w. of Ptolemy II. (who killed his first wife, another A., at his marriage); accorded divine honours in her lifetime; she and her husband both called Philadelphus through their consanguinity. Another A. was sister of Cleopatra.

ARSINOTHERIUM, extinct giant mammal discovered in Middle Eocene of Egypt, with pair of large horns above the muzzle, in front of another small pair.

ARSON, the act of wilfully setting fire to a house, barn, stack, or any public or private building. The punishment, according to the nature of the crime, is two years' imprisonment, or penal servitude for from three years to a life sentence. In Scotland the crime is known as 'fire-raising.'

ARSUF (32° 11' N., 34° 51' E.), town, Palestine; site of ancient Apollonia; here Crusaders under Richard Cœur de Lion defeated Saracens under Saladin, Sept. 7, 1191.

ART, many attempts to define 'art' have been made, but no very satisfactory results have been achieved. Dr. Johnson's definition runs: 'The power of doing something which is not taught by Nature or by instinct'; Pope says: 'True art is Nature to advantage dressed'; while Sir Thomas Browne tells us: 'Nature is the art of God.' If it be conceded, however, that Art includes everything which we distinguish from Nature, it will readily be seen that Johnson's definition is very wide of the mark. It is the business of art to develop nature, and no art can exist either in form, colour, sound, speech, or movement, which is not in the first place inspired by nature. 'Living Art,' says Mr. Frank Brangwyn, 'is only to be found in the interpretation of Life.' The earliest attempts at pictorial art which have been discovered amongst the remains of primitive peoples invariably take the form of rude drawings of birds and beasts. It may therefore be supposed that early man had been impressed by the physical beauty of these animate objects, and had, from an instinctive love of the beautiful, attempted to perpetuate them. It has been said that 'A man's the noblest work of God,' and thus it came about that those early masters of sculpture (*q.v.*), Phidias and Praxiteles, casting about for objects upon which to exercise their genius, found their ideal in reproducing the perfect beauty of the human form. So with painting (*q.v.*), with poetry (*q.v.*), and with music (*q.v.*), Nature is ever the first means of inspiration. The glory of the sunrise, the terror of the storm, the song of the lark, the beauty of the summer landscape, each

in its own way arouses to noblest effort the painter, the musician, and the poet; and so Nature, working through man, produces what we term Art.

Art Galleries.—National, municipal, or private buildings for the exhibition of paintings, sculptures, and other works of art, for the purpose of fostering and educating a taste for æsthetics. Amongst buildings of the kind the National Gallery, London (founded 1824), holds a deservedly high place. It is maintained by a government grant, and has been enriched by numerous private bequests. With the exception of the French, the Gallery is well represented by practically every school, some outstanding pictures being Raphael's *Madonna* (bought for £70,000), Vandyck's *Charles I.* (bought for £17,500), and Velazquez's *Venus*. The National Portrait Gallery (founded 1856), the Tate Gallery, and the Wallace Collection should also be mentioned, while other galleries in London and provincial towns are too numerous even to be named. Amongst great continental galleries the place of honour should undoubtedly be given to the Louvre, in Paris, while other institutions of world-wide fame are the Imperial Gallery at Vienna, those at Berlin, Dresden, and Munich, and the Hermitage Gallery at St. Petersburg. Among the famous galleries in U.S.A. are the Museum of Art, New York, and Museum of Fine Arts, Boston, which represent all schools; the Academy, Philadelphia, the Chicago Collection and Lenox Library, New York, rich in Flemish and French pictures; and there are the splendid collections of the late J. Pierpont Morgan, and Mrs. Gardner. In Italy the Pitti and Uffizi Galleries, at Florence, are of the first importance, the former being especially rich in examples of Raphael, Giorgione, Perugino, and Andrea del Sarto, the latter in works by Michaelangelo, Botticelli, and Leonardo da Vinci. Other celebrated galleries are at Rome (Corsini and Borghese Galleries), Venice, Genoa, Milan, Pisa, Verona, Perugia, and Padua; at The Hague, Haarlem, Rotterdam, and Leiden; at Antwerp, Bruges, and Cologne; and at Seville and other cities of Spain.

The Art Galleries of Europe (series); Gower, *Handbook to Art Galleries of Belgium and Holland*; Hare, *The National Gallery*; Brockwell and Konody, *The Louvre*; Konody, *The Uffizi Gallery*.

Art Societies.—Since the establishment of the Royal Academy (*q.v.*) it has been the custom in Great Britain for professional artists to attach themselves to some existing society, and in course of time offshoots from these have taken root, and have attracted followers according to the particular branch of art for which they have stood. Amongst the oldest of the kind may be named the Royal Society of Painters in Water Colours (founded 1804), and the Royal Society of British Artists (1823). Societies of later date include the New English Art Club, the Society of Portrait Painters, Royal Society of Painter-Etchers and Engravers, Society of Women Artists, and the Pastel Society; and in the provinces: the Royal Birmingham Society of Artists (founded 1825), the Manchester Academy of Fine Arts, and the Yorkshire Union of Artists (Leeds). In Scotland the societies include the Royal Scottish Academy, Royal Society of Painters in Water Colours, and the Society of Scottish Artists.

Art Teaching.—Towards the end of the first half of the XIX. cent. public interest began to be aroused in England in the industrial arts, and, with a view to putting the study upon a more systematic basis than had hitherto been known, a government grant was made for the purpose in 1836, and in the following year the first school of design was established at Somerset House. This was followed by the foundation, in 1852, of 'the Department of Practical Art,' at Marlborough House, which eventually found quarters at South Kensington. Very soon other schools of like kind came into existence, amongst which may be mentioned the Slade School of Drawing, Painting, and Sculpture, the Royal Female School of Art, the School of Art Wood-Carving, the Royal School of Art

Needlework, and provincial schools for art training, those at Birmingham and Manchester being especially notable, the latter having the advantage of Mr. Walter Crane as director for several years. In U.S.A., among the foremost of many flourishing schools are those at the National Academy of Design (1802) and at the Boston Museum of Fine Arts, the School of Applied Design for Women and Cooper Institute, N.Y., and the Art Institute, Chicago.

ART AND PART, in Scots law, the aiding in, or abetting, a crime.

ARTA (39° 8' N., 20° 58' E.), town, Greece. Pop. 9000. **Arta**, Gulf of (38° 57' N., 21° E.), arm of Ionian Sea.

ARTABANUS.—(1) Persian captain who murdered Xerxes, 465 B.C., and was slain by Artaxerxes, s. of Xerxes. (2) Name of four Parthian kings of III. cent. B.C.; with death of A. IV. in war with Rome, 226, Arsacid kingdom came to an end.

ARTAGNAN, CHARLES DE BAATZ D' (c. 1612-73), original of character d'A. in *Three Musketeers* and other tales of Dumas.

ARTAXERXES I. (405-425 B.C.), king of Persia, younger s. of Xerxes; he made peace with Athens in 448, but did not take sides in the Peloponnesian War; is famous in Jewish history.—**Artaxerxes II.**, king of Persia (404-359), s. of Darius II.; many rebellions took place in his reign, and for long the empire was weak under him.—**Artaxerxes III.**, king (359-338); name adopted by Ochus, s. of preceding; he ruled sternly, compelled Athens to make peace, and tried to conquer Egypt.—**Artaxerxes IV.**, or Ardashir I. (q.v.).

ARTEDI, PETER (1706-35), Swed. zoologist, authority on fishes; friend of Linnæus.

ARTEGA, mixed race of African Arabs.

ARTEMIDORUS.—(1) (fl. 100 B.C.) Ephesian geographer who compiled a cartographical work (now lost) drawn upon by Strabo. (2) Roman soothsayer who flourished during the rule of Hadrian.

ARTEMIS (classical myth.), dau. of Zeus and Leto, and twin-sister of Apollo. She is sometimes called Orygia and Cynthia, from places associated with her birth. To the Romans she was known as Diana, the goddess of hunting. A. was worshipped by the Greeks under various names, to each of which belonged special characteristics. Thus she is known as the Arcadian, Ephesian, and Brauronian A. Under the first-named aspect she is the goddess of hunting and chastity, who led a life of strict celibacy, and took terrible vengeance upon those who incurred her anger. Thus she changed the hunter, Actæon, into a stag, and caused him to be devoured by his dogs, because he had watched her bathing. The Ephesian A., known as 'Diana of the Ephesians' (*Acts* 19), was a very ancient Asiatic deity of Persian origin, whose worship the Gk. colonists found already established when they settled in Asia Minor, and whom they chose to identify with their own A. This goddess represented rather the omnipotence of love and the fruitfulness of nature. Her temple at Ephesus ranked among the seven wonders of the world. The Brauronian A. was a deity worshipped by Gk. settlers in the Taurica Chersonnesus (Crimea), to whom all strangers landing there were sacrificed. The priestess, Iphigenia, is stated to have brought the image of the goddess from Tauris to Brauron, in Attica, which gave rise to the name by which she is known. The most famous statue of A. is that known as the 'Diana of Versailles,' found in Hadrian's Villa, and now preserved in the Louvre.

ARTEMISIA, see WORMWOOD.

ARTEMISIA.—(1) (fl. 480 B.C.) Queen of Halicarnassus; famed for Amazonian qualities. (2) (fl. 353-350 B.C.) Queen who built the Mausoleum in Halicarnassus, one of seven wonders of the world.

ARTEMUS WARD, pseudonym of CHARLES FARRAR BROWNE (1834-67), Amer. humorist whose lectures in America and Europe and writings had great success.

ARTENA (41° 42' N., 12° 53' E.), town, central Italy Pop. 5016.

ARTERIES, the vessels which carry the blood from the heart to the different parts of the body. The walls of a's consist of three coats: the external, or *tunica adventitia*, of fibrous tissue; the middle, or *tunica media*, of muscular and yellow elastic tissue, muscular fibres predominating in the larger and elastic fibres in the smaller a's; and the internal, or *tunica intima*, of endothelial cells. The two chief a's of the body are the pulmonary a. and the aorta: the pulmonary a. conveys the impure, or venous blood, from the right side of the heart to be purified in the lungs, while the aorta conveys the purified blood from the left side of the heart, to which the blood comes from the lungs, to the tissues of the body by means of its branches. Small a's join, or anastomose, with one another freely; so that, if a large a. is blocked, the circulation can be carried on by the anastomosing branches, except in the case of the 'end-arteries,' found, e.g., in the brain and the spleen, which do not anastomose with others; and consequently when one of the 'end-arteries' is blocked, the part which it supplies with blood dies.

ARTERN (51° 22' N., 11° 16' E.), town, Saxony. Pop. 5800.

ARTESIAN WELLS, name derived from a system of boring for water, which was first employed in Europe in the province of Artois, France. The fountains in Trafalgar Square are thus supplied; also several of the London breweries. The borings are made by means of spiral rods, and are carried through various strata until a water-carrying bed is reached. The water rises to the surface in virtue of hydrostatic pressure, its source being higher than the mouth of the boring.

ARTEVELDE, JACOB VAN (c. 1290-1345), Flemish leader and brewer; rose to prominence in his native city of Ghent in 1337; he ruled like a king, and Ghent prospered, but A. was killed in a popular rising, 1345.

ARTEVELDE, PHILIP VAN (d. 1383), Flemish military leader; killed at *Roosebeke*.

ARTHRITIS, inflammation of joints, usually associated with gout or rheumatism.

ARTHROPODA, phylum of bilaterally symmetrical, segmented animals, having variously modified jointed appendages and a cuticle of chitin. Numerous affinities exist between them and Annelids, notably in the division of the body into segments, the organisation of blood-vascular and nervous system. A. are usually very active, and represent more than half the known species of animals. The chief classes are *Crustacea* (q.v.); *Prototracheata*, including the primitive *Peripatus* (q.v.); *Myriopoda* (q.v.), the centipedes and millipedes; *Hexapoda* (q.v.), insects; *Arachnoidea* (q.v.), spiders, scorpions, and mites; *Palæostraca* (q.v.), the king-crab; and the extinct eurypterids and trilobites (q.v.). The *Pantopoda* (q.v.) or *Pycnogonida* (sea-spiders) have not been satisfactorily classified.

ARTHUR, KING (VI. cent.), Brit. king, the actual facts of whose life are almost lost in legend. He is said to have been the s. of Uther Pendragon, by Igraine, wife of Gorlois, king of Cornwall. He was probably half-Roman, and chosen by the Christian Britons as general (about 520 A.D.) against the Saxons, whom he defeated; afterwards he fought the heathen Britons, and was betrayed and slain.

Arthurian Legend.—After his death A. became a hero of Celtic legend in Cornwall, Wales, and Cumberland. About 850 Nennius mentions him and his battles against the Saxons, and the treachery of his nephew Mordred. In Welsh poetry of the XI. and XII. cent. he is spoken of as half-man, half-wizard, and the names of his allies, Kay, Bedivere, and Geraint, are given. The Welsh legends were carried to Brittany and France, whence the Romans brought them to England. About 1120 Geoffrey of Monmouth introduced Arthur into his *History of the British Kings*, dwelling on his miraculous birth and death, his conquests, and the chivalrous side of the legend. This book was put into verse by Wace, a Norman, and Layamon, an Englishman (about 1150), each adding legendary

touches, such as that of Excalibur, Arthur's sword. In France the legend became mixed with other legends, such as those of the Holy Grail, Percival, Lancelot and Tristram, and the idea of the 'Round Table' arose. The chief Fr. poets of Arthurian legend are Chrétien de Troyes and Marie de France. In Germany the legend was further amplified by Wolfram von Eschenbach. In the prose romances of the XIII. and XIV. cent. (notably those of Walter Map) the story of Lancelot and Guinevere (A.'s wife) was evolved. Later on, most of the Arthurian cycle was collected by Sir Thomas Malory in his *Morte d'Arthur* (1470). In late Eng. literature the legend has been dealt with by Spenser in his *Faery Queen*, Tennyson in his *Idylls of the King*, and Swinburne in *Tristram of Lyonesse*.

ARTHUR I. (1187-1203), Duke of Brittany; supposed to have been murdered by John, king of England.

ARTHUR III. (1393-1458), Earl of Richmond, Constable of France; fought against England at Agincourt, and under Joan of Arc; captured Paris from the English, 1436; succ. his nephew, Peter II., as Duke of Brittany, 1457.

ARTHUR, CHESTER ALAN (1830-86), Pres. (Republican) of the U.S.A. on death of Pres. Garfield, 1881; his term of office was noted for tariff legislation, the prohibition of polygamy in the territories, and railway enterprise.

ARTHUR'S SEAT, hill (822 ft.) of volcanic origin east of Edinburgh; shape, recumbent lion; name first occurs at end of XV. cent.

ARTICHOKE, two plants of order Compositæ; *Helianthus tuberosus* or Jerusalem a., now cultivated as vegetable for its edible tubers, and *Cynara scolymus*, the globe a., for succulent leaf scales and axis of flower heads.

ARTICLE (Fr., from Lat. *articulus*, dim. of *artus*, joint), division, and, by transference, portion between divisions; hence applied to clauses of agreements (in same sense as *capitulum*), items in magazines, etc.; again by transference, any separate object. Various Christian codes are known as a's of faith. *Ten A's*, 1536, promulgated by Henry VIII. as modifications of Roman Catholic doctrines; *Six A's* ('Whip with Six Strings'), 1539, restored Catholic usages as to private Masses, auricular confession, marriage of priests, etc.; *Thirty-Nine A's*, 1563, formed from forty-two set forth by Cranmer's commission, 1553; confirmed 1571 and 1604; contained in Book of Common Prayer; accepted by Irish Church, 1835; Scottish Episcopalian at end of XVIII. cent. Other religious A's are *A's of Perth*, 1618, agreed upon by Scottish General Assembly; *Twenty-Five Methodist A's*, 1784; *Thirty-Five A's of Reformed Episcopal Church*, 1875. *A's of Association*, legal term for written agreement as to mode of carrying on business of a limited company. *A's of the Navy* are rules by which navy is governed under Naval Discipline Acts, 1866 and 1884. *A's of War* are rules by which both army and navy are governed. Military A's of War used to be passed granting special criminal powers to commander in time of war; series of Mutiny Acts commenced 1689; Army Act, 1881 (passed annually), superseded earlier legislation; by it power of admiralty to provide for naval discipline is confirmed.

ARTICULAR, belonging to or associated with the joints; whence a. sensations are sensations dependant upon sense-organs in or about the joints.

ARTICULATA, obsolete zoological term for animals, like insects, with jointed appendages.

ARTICULATION, juncture of bones in skeleton (anat.); distinct production of sound in speech.

ARTILLERY was the name given to any kind of military engine for the throwing or firing of projectiles, including bows and arrows, slings, and such weapons as were known to the ancients by the name of the *catapulta* and the *balista*. The term is now applied to any kind of cannon or ordnance, and in general to all the officers, men, horses, waggons, etc., engaged in the working or transport of the guns.

Cannon were first employed by the English in field operations at Crécy (1346), but it is believed they were used by the Germans in Italy some years before. The early guns, however, were used chiefly for siege purposes, and it was not until the first half of the XV. cent. that field artillery came into general use. During the period of the Wars of the Roses the bowmen were regarded as the chief strength of both armies, but field guns were in frequent use, and *Loose Coat Field* (1470) is said to have been won by Edward IV.'s ordnance. Cannon, however, continued for a long time afterwards to be used chiefly for battering purposes, a notable example being the siege of Constantinople by the Turks in 1453, when they employed some very heavy artillery. Gustavus Adolphus (d. 1632) during the Thirty Years' War was the first general to make really effective use of field guns, his heavier weapons firing 12-pounder shot, and his demi-culverin 9-pounders. During the Eng. Civil War the Royalists were often very badly served by their a., which frequently arrived late, or not at all. Cromwell, on the other hand, made little use of a., except for sieges.

The earliest cannon consisted of bars of wrought-iron welded together with iron hoops, and were fixed on blocks. These eventually gave place to guns of cast-iron and brass, wheeled carriages were introduced, and iron balls to some extent superseded those of stone. The XVI. cent. brought us the culverin, demi-culverin, saker, and falcon. The old Eng. culverin was a very clumsy piece of ordnance, which required a considerable number of horses to drag it into position, and as cartridges had not then been introduced, its effectiveness in the field must have been largely discounted by the slowness with which it was loaded, the powder being put in with a ladle.

The Honourable Artillery Company, which is the oldest existing Volunteer force in England, was established in 1537. The Royal Regiment of Artillery was created in 1716.

From the XVI. to the XIX. cent. little progress was made in the manufacture of a., but during the last quarter of a cent. rapid strides have been made, with the result that the ordnance of the civilised world has now been brought to a high state of effectiveness. The British a. of the present day is classed as Horse, Field, and Garrison A. Horse A., mounting its men either on horses or the limbers of the guns, is required to manoeuvre with cavalry, in which it differs from the Field A. A battery consists of 179 men and 16 carriages, and its guns are 15-pounders. A Field A. battery is composed of 171 men, and 6 guns of somewhat heavier calibre than those used by the Horse A., each gun being drawn by 6 horses. The Garrison A., as the name suggests, is a force organised chiefly for fortress and siege purposes, and the working and transport of the heaviest class of guns. See also **AMMUNITION**, **ORDNANCE**, and **TACTICS**.

Lloyd and Haddock's *Artillery, its Progress and Present Position* (1893); and Raikes's *History of the Hon. Artillery Company* (1878-80).

ARTIODACTYLA, sub-order of Mammalian order Ungulata, in which the third and fourth digits of the foot are equally developed, as contrasted with the *Perissodactyla*, or odd-toed animals, such as the horse and rhinoceros. The stomach is complex in many A. (camels, ruminants); the premolars are single-lobed, while molars have two lobes; and there are often bony outgrowths on frontal bones. They may be divided into four groups: (1) *Suina*, including pigs, hippopotami, and peccaries; (2) *Tylopoda*, the camels of the Old World and llamas of S. America; (3) *Tragulina*, or chevrotains of the East Indies and W. African coast; (4) *Pecora*, or true Ruminants, such as deer, giraffes, gazelles, antelopes, goats, sheep, and cattle.

ARTOIS (50° 30' N., 2° 30' E.), former province, N. France; after belonging in turn to Flanders,

France, Burgundy, Austria, and Spain, finally reverted to France in 1659.

ARTS AND CRAFTS, term which first came into general use with the establishment of the Arts and Crafts Society in 1888. The society was the outcome of a feeling of discontent amongst many artistic workers, who considered that the decorative arts, apart from painting, were not sufficiently recognised. The cultivation of artistic craftsmanship owed much to the example and inspiration of William Morris and his associates, and arts and crafts exhibitions are now frequent throughout Great Britain.

ARTS, MASTER OF, graduate of university who has passed examinations in literary subjects, or literary and scientific mixed. In some universities the M.A. degree is granted without further examination to those B.A.'s (*Bachelors of Arts*) who pay certain fees (Oxford and Cambridge), in others to all honours graduates, some fixed time after taking the B.A. degree.

ARU ISLANDS, ARRU (5° 20' to 7° S., 134° to 135° E.), islands, Dutch East Indies. Pop. c. 21,000.

ARUBA ISLAND, part of Dutch colony of Curaçao, West Indies.

ARUNDEL (50° 51' N., 0° 33' W.), town, Sussex, England; castle, dating from before Conquest, was damaged in Civil War; restored in XVIII. cent.

ARUNDEL, EARLDOM OF.—It may fairly be said that there were Norman Earls of Arundel, for they resided at the Castle, though they generally seem to have taken their title from the county of Sussex. William d'Aubigny, who m. Adeliz of Louvain, widow of King Henry I., was created Earl of A. After the death of the last earl in the male line in 1243, the title passed to the FitzAlans, John FitzAlan, feudal lord of Clun, marrying Isabel FitzAlan. Richard, 4th earl of A. and Surrey, a member of the Council of Richard II., was executed 1397. Henry, 12th earl, was prominent under Edward VI., Mary, and Elizabeth. He was a R.C., and fell into disfavour for a time. He was High Steward and Chancellor of Oxford Univ.; on the Commission for trial of Mary, Queen of Scots; again imprisoned for plotting; finally released, 1572; d. 1580. His s. predeceased him, and his dau. Mary married Thomas Howard, Duke of Norfolk, with which title the A. earldom is now held by Act of Parliament, 1627—not, as sometimes stated, by feudal tenure. Of later earls most important are Philip, 13th earl; became R.C.; d. in Tower, 1595; and Thomas, 14th earl, Royalist and art collector; purchased Arundelian or Oxford Marbles; d. abroad, 1646.

ARUNDEL, THOMAS (1353–1414), abp. of Canterbury, supported claims of Henry IV., whom he crowned; made vigorous efforts to suppress Lollardy.

ARUNDELL OF WARDOUR, THOMAS ARUNDELL, 1ST BARON (c. 1562–1639); went abroad and served against the Turks under the Emperor Rudolph II., who in 1595 cr. him Count for his bravery at the battle of Gran; on his return cr. Baron A. of W., 1605.

ARUSIANUS MESSUS (IV. cent. A.D.), Latin scholar; author of *Exempla Elocutionum*, containing examples from classic writers.

ARUWIMI, administrative district, Belgian Congo, Africa. River A. (1800 miles long) joins Congo, 2° N., 23° E.

ARVAL, light spiced cake, formerly used at funeral feasts (arval-dinners); the name is derived from a Norse word meaning 'hair-ale.'

ARVAL BRETHREN (*Fratres Arvales*), a priesthood, in ancient Rome, consisting of twelve members, who for three days during May conducted the annual sacrifice (*amburvalia*) for the purpose of propitiating Ceres, the goddess of fertility. The reigning emperor was usually a member of the brotherhood.

ARVE (46° 5' N., 6° 25' E.), river, Savoy and Switzerland; receives in valley of Chamouni the

Arveyron, which descends from glacier through cave known as 'Ice-Gates of Arveyron.'

ARVERNI, Gallic tribe subdued by Caesar, 52 B.C.; gave name to Auvergne, France.

ARVERS, ALEXIS FELIX (1806–50), Fr. poet and dramatist; sonnets famous.

ARYA SAMAJ, sect of Hindu religious reformers founded (c. 1806) by a Brahman, Dayanand Saraswati, who studied the Vedas in the light of modern scientific culture.

ARYAN is a name given to the Indo-European family of languages, to which English belongs. It is a word of Sanskrit origin meaning *noble*, and was the name whereby the Old Hindus distinguished themselves from the less civilised peoples of India. The early A's were probably a community of tribes living in inland Russia. They evolved a primitive vocabulary which is the foundation of most of the literary languages of Europe, Persia, and India. The names of the sun, moon, stars, of the simple parts of the body (e.g. head, eye), of the most intimate relationships (e.g. father, mother), and of the numbers up to ten, being found in various forms in most of the Indo-European languages, probably date from this early vocabulary. In course of time the A. community split up, some going east into Persia and India, others west into Europe, and in their new homes the various Indo-European languages developed. The following are the main groups of Indo-European or A. languages: Indian (including Sanskrit, Pali, Hindustani, Bengali, and the Gipsy dialect), Iranian (including Persian), Celtic (Irish, Gaelic, Manx, Welsh, and Breton), Hellenic (Ancient and Modern Greek), Italic (Latin, French, Italian, Spanish, Portuguese, Provençal), Slavonic (Russian, Polish, Bohemian), Lettic (Old Prussian, Lithuanian), and Teutonic (Old Gothic, German, English, Dutch, Danish, Norse, and Swedish).

ARYL, any aromatic radical, such as phenyl (C₆H₅) to lyl (C₆H₄CH₂), etc., with a free valence belonging to the nucleus.

ARZAMAS (55° 30' N., 43° 45' E.), town, Russia. Pop. 10,591.

AS, Rom. measure; weighed 1 lb. of 12 oz. or 327.45 grs.; also name of coin of which lower parts were semis, triens, quadrans, sextans, uncia; originally lb. weight, but depreciated in Punic Wars and lowered by *lex Papiria*, 89 B.C., to $\frac{1}{2}$ oz.; name of early Italian coin.

ASA, famous king of Judah.

ASAFETIDA, a gum-resin obtained from root of a plant (*Ferula fetida*) chiefly growing in eastern Persia and Afghanistan; has an unpleasant and characteristic odour; is used as a nervous stimulant, e.g. in hysteria, also as stimulant to the respiratory and alimentary tracts.

ASAKY, GEORGE (1788–1871), Rumanian author; founded Rumanian literature, journalism, theatre, etc.

ASAPH, psalmist and prophet mentioned in Bible (*Chronicles* and *Psalms*); Asaphites afterwards assisted in service of Temple at Jerusalem.

ASAPH, BISHOPRIC OF ST. N. WALES; traditional founder, Kentigern, bp. of Glasgow; also said to have established St. A. as bp. c. 560.

ASARONE, sour chemical distilled from asarabacca.

ASBESTOS (unconsumable), amphibole mineral of fibrous texture or variety of serpentine occurring in N. America, S. Africa, Australia, and Europe, formerly sometimes woven into fabrics, now generally used as a fireproof and heat-retaining material for building, packing steam-pipes, etc., fabrics, filters for corrosives, electric insulating, and other purposes.

ASBJÖRNSSEN, PETER CHRISTEN (1812–85), Norwegian writer who with Jørgen Engebreetsen Moe (1813–82) collected and edit. a series of *Norwegian Popular Stories*, many trans. into English by Sir George Dasent. His folk-tales rank as classics.

ASSURY, FRANCIS (1745–1816), Eng. Methodist preacher; app. by Wesley to undertake missionary

work in America; known as 'the Father of Amer. Methodism.'

ASHBURY PARK (40° 14' N., 74° W.), town, New Jersey, U.S.A. Pop. (1910) 10,150.

ASCALON, ASKALAN (31° 38' N., 34° 37' E.), ancient city, Philistia, Palestine; ruined; birth-place of Herod the Great; scene of great battle between Crusaders and Saracens.

ASCANIUS (classical myth.), s. of Aeneas by Creusa, was saved from flames of Troy by his f., whom he accompanied to Italy; succeeded Aeneas in kingdom of Latium; built Alba, to which he transferred the seat of his empire from Lavinium; also known as Iulus, and the Julian family of Rome claimed him as their ancestor.

ASCENSION (8° S., 14° 20' W.), lonely island of volcanic origin, south Atlantic; discovered by Portuguese on Ascension Day, 1501; Brit. since 1815; area, 34 sq. miles; fortified; has sanatorium on Green Mountain; abounds in turtles. Pop. (1910) c. 400.

ASCENSION, FEAST OF THE, Christian festival dating at least from IV. cent., forty days after Easter, in celebration of A. of Christ; always on Thursday.

ASCENSION, RIGHT, of a star is measured by arc of celestial equator between its declination circle and the first point of Aries (Vernal equinox). Declination is its distance from equator measured along arc of great circle (declination circle) passing through star and pole.

ASCETICISM, the practice of self-denial, often very severe, has been frequent in Christianity and other religions. It has taken many forms, abstinence from wine, flesh, and marriage, fasting, and infliction of self-tortures. It is related of St. James, traditional first bp. of Jerusalem and 'brother' of Christ, that he never anointed himself and never had a bath, and that he spent so long kneeling on the stone floor of the Temple that his knees became hard like a camel's. Abstinence from various meats (e.g. swine's flesh among Jews and beef among Hindus) rests often on primitive ideas of *taboo*—i.e. a certain animal was holy and akin to God and His people, and its flesh only eaten sacramentally, if at all. A. in Christianity was 'organised' in monasticism, but outside it has often been practised, especially in the early and mediæval Church, and still in Catholicism, where the Church has had sometimes to repress extreme developments. Thus by some even marriage was thought unclean. In Buddhism and other Oriental faiths, where the body and its passions must be subjugated, terrible austerities are practised.

Robertson Smith, *Religion of the Semites*; Frazer, *Golden Bough*.

ASCHAFFENBURG (49° 49' N., 9° 11' E.), cathedral town, Bavaria; castle (Johannisburg) was once residence of prince bp's of Mainz; manufactures paper, liqueurs, tobacco. Pop. (1910) 29,900.

ASCHAM, ROGER (1515-88), Eng. author; b. Kirkby Wiske (Yorks.); s. of steward to Lord Soroke of Bolton; ed. in household of Sir Anthony Wingfield, and later at St. John's Coll., Cambridge. Here he devoted himself especially to study of Greek, received a fellowship, and became lecturer in Greek; was also proficient in archery, and his first work, *Toxophilus* (1545), dealt with that subject, and was dedicated to Henry VIII. He became univ. orator, and tutor to the Princess Elizabeth, and Latin sec. to Edward VI., Mary, and Elizabeth. His principal work, *The Scholemaster* (1570), was a treatise on the teaching of Latin.

ASCHERSLEBEN (51° 46' N., 11° 26' E.), town, Saxony. Pop. 27,900.

ASCIANO (43° 15' N., 11° 34' E.), town, Siena, Italy.

ASCILIUS SULCATUS, predatory fresh-water beetle. See COLEOPTERA.

ASCITANS, early Christians who at their gatherings danced around a wine-skin.

ASCITES, an effusion of watery fluid into the abdominal cavity; non-inflammatory, and usually due to obstruction of the liver blood supply.

ASCLEPIADES (end of II. and beginning of I. cent. B.C.), Gk. physician; b. Prusa, Bithynia; flourished in Rome, where he had numerous pupils.

ASCLEPIADES (fl. 270 B.C.), Gk. lyric poet of Samos, who established forms of verse called *Asclepiadean*.

ASCOLI, GRAZIADIO ISAIA (1829-1907), Ital. philologist, and the principal modern authority on the Ital. language.

ASCOLI PICENO—(1) (42° 51' N., 13° 33' E.) Cathedral town, Italy; ancient *Asculum Picenum*, burnt by Romans, 89 B.C.; Rom. gate, parts of walls, etc., remain; castle, baptistery; manufactures glass, paper. Pop. (1911) 30,600. (2) Province, central Italy; area, 796 sq. miles. Pop. (1911) 252,000.

ASCOT (51° 24' N., 0° 40' W.), village, Berkshire, England. A. Races take place in June, on a circular course nearly 2 miles in length.

ASCULUM, ancient Ital. town probably on site of present Ascoli Satriano; scene of Pyrrhus's victory, 279 B.C.; destroyed by Robert Guiscard, XI. cent.

ASCUS, membranous spore-sacs (sporangia) of Ascomycetes (bot.).

ASELLUS AQUATICUS, the water-slater, an Isopod crustacean. See MALACOSTRACA.

ASGARD, heaven of Norse mythology; opposed to *utgarth*, abode of monsters, *midgarth*, abode of men; inhabited by the *Æsir*, of whom Odin is ancestor and chief; in A. Odin dwells at *Gladheim*, where is *Val-halla*, home of heroes slain in battle; Thor has *Thruthvang*; Balder, *Breidablik*; Freya, *Folkvang*; Ull, *Ydalir*; Vali, *Valaskjalf*; Saga, *Sokkvabekk*; Skadi, *Thrymheim*; Heimdal, *Himinbjorg*; Forseti, *Glimir*; Njord, *Noatun*; Vidar, *Landvidi*.

ASGILL, JOHN (1659-1738), Eng. lawyer and pamphleteer; sat in English and Irish Parliaments; and spent last thirty years of his life as a debtor in the Fleet Prison.

ASH (*Fraxinus excelsior*), tree belonging to order Oleaceæ, grown for timber in Great Britain; other species occur in Europe, Asia, and N. America. The mountain a., or rowan, belongs to the pear and apple tribe of the order Rosaceæ.

ASH WEDNESDAY, first day of Lent; the custom of sprinkling ashes on heads of penitents that day still survives in the R.C. Church.

ASHANTI (7° N., 1° 40' W.), Brit. territory, Gold Coast Colony, W. Africa; area, c. 20,000 sq. miles. Surface covered with wood; land cultivated in neighbourhood of towns produces large crops of grain, tobacco, sugar, coconuts, and pine-apples; gums, dye-woods, and timber are also important. Chief town, Kumasi (q.v.). Chief rivers, Volta, Black Volta, Tana, Bia. Climate is none too healthy. Flora includes mimosa, ferns, many trees; fauna includes elephants, monkeys, snakes, crocodiles, hippopotami.

History.—Early history is obscure; nation traditionally formed by tribes forced to emigrate southward by spread of Muhammadan empire. First hist. record occurs early XVIII. cent., when Osei Tutu conquered neighbouring tribes, and made Kumasi centre of his dominions. Later ruler, Osei Tutu Quamina, became involved in war with Britain as result of his depredations in Fantiland, 1807-26. War again occurred, 1873-74, when Wolseley defeated Ashantis at Amoaful and took Kumasi; and in 1895-96, when King Prempeh (q.v.) was deposed and exiled. Province was annexed by Britain, 1901; governed by gov. of Gold Coast or his representative.

Chief exports are gold dust and palm oil. Rubber is produced. Natives manufacture cotton goods, gold and silver work, earthenware; they are of negroid race. Principal religion, spirit worship; polygamy is still practised, and human sacrifices were formerly customary. Pop. variously estimated at from 500,000 to 2,000,000.

ASH'ARI, X.-cent. Arab. theologian.
ASHBOURNE (53° 1' N., 1° 44' W.), town, Derbyshire, England. Pop. (1911) 4050.

ASHBOURNHAM, JOHN (1603-71), Eng. Royalist, became treasurer and paymaster of the king's army; with him in prison, 1647; suspected unjustly of disloyalty, but restored to favour after the Restoration; M.P. for Sussex, 1661-67.

ASHBURTON.—(1) (50° 31' N., 3° 44' W.) town, Devonshire, England; Stannary town since 1328. (2) (23° 16' S., 116° 15' E.) river, W. Australia; enters Exmouth Gulf. (3) (44° 3' S., 171° 48' E.) river, New Zealand; also called Hakatere.

ASHBURTON, ALEXANDER BARING, BARON (1774-1848), Eng. politician and banker; M.P. (1800-35); or. peer (1835); was commissioned to negotiate the arrangement at Washington (1842) of the 'Ashburton Treaty,' dealing with the suppression of slave trade, and defining the boundary line between Canada and Maine, etc.

ASHBURTON, JOHN DUNNING, 1ST BARON (1731-83), Eng. lawyer; famous for his defence of John Wilkes; was sometime Solicitor-General; member for Calne (Wilts); and Chancellor of the Duchy of Lancaster.

ASHEY, TURNER (1824-62), Amer. Confederate general.

ASHEY-DE-LA-ZOUCH (52° 44' N., 1° 26' W.), town, Leicestershire, England. Pop. (1911) 5000.

ASHDOWN (51° 33' N., 1° 36' W.), 3½ miles N.W. of Lambourn, Berks; possibly scene of battle of Assandune, 871, between Alfred the Great and Danes.

ASHERO (45° 25' N., 127° 5' E.), town, Manchuria. Pop. c. 50,000.

ASHER, Israelitish tribe called after the s. of Jacob and Zilpah (*Genesis* 30¹⁴).

ASHES, the inorganic residue from the combustion of organic material.

ASHEVILLE (35° 37' N., 82° 33' W.), town, N. Carolina, U.S.A.; tanning, brick and tile making, cotton mills; health resort. Pop. (1910) 18,762.

ASHFIELD (33° 50' S., 151° E.), town, New South Wales, Australia, 5 miles S. of Sydney. Pop. 14,331.

ASHFORD (51° 8' N., 0° 52' E.), town, Kent, England. Pop. (1911) 13,700.

'ASHI (382-427), Babylonian scholar; first editor of the *Talmud*, which was completed, after his death, by Rabina.

ASHINGTON (55° 10' N., 1° 34' W.), town, Northumberland, England. Pop. (1911) 24,600.

ASHLAND.—(1) (36° 32' N., 82° 40' W.) town, Kentucky, U.S.A.; iron and steel manufactures. Pop. (1910) 8688. (2) (40° 47' N., 76° 22' W.) borough, Pennsylvania, U.S.A.; anthracite coal mining. Pop. (1910) 6855. (3) (46° 35' N., 90° 53' W.) town, Wisconsin, U.S.A.; fine harbour; lumber and iron trade; foundries, sawmills. Pop. (1910) 11,594.

ASHLEY, WILLIAM JAMES (1860-), Eng. economist; professor at Toronto and Harvard Univ.; prof. of Commerce in Birmingham Univ. since 1901; has pub. *History of English Woollen Industry* (1887), *English Economic History and Theory* (1888-93), *Adjustment of Wages* (1903), etc.

ASHMOLE, ELIAS (1617-92), Eng. antiquary; b. Lichfield; ed. Oxford; founder of the Ashmolean Museum, Oxford; devoted much time to the study of astrology, and pub. *Theatrum Chymicum Britannicum, The Way to Bliss* (dealing with the 'philosopher's stone'), and a *History of the Order of the Garter*.

ASHMUN, JEHUDI (1794-1828), organised negro State of Liberia under auspices of Amer. Colonisation Soc. (1822-28).

ASHRAF, African Arabs claiming descent from Muhammad.

ASHEREF (36° 40' N., 53° 30' E.), town, Persia. Pop. c. 6000.

ASHTABULA (41° 53' N., 80° 45' W.), town, Ohio, U.S.A. Pop. (1910) 18,226.

ASHTON-IN-MAKERFELD (53° 29' N., 2° 38'

W.), town, Lancashire, England. Pop. (1911) 21,540.

ASHTON-UNDER-LYNE (53° 29' N., 2° 5' W.), town, Lancashire, England; cotton-weaving, bleaching, dyeing, print works, machinery. Pop. (1911) 45,179.

ASHTORETH, see **ASTARTE**.

ASIA, largest continent; bounded N. by Arctic Ocean, E. by Pacific, S. by Ind. Ocean, S.W. by Africa, W. by Europe; greatest length, c. 5150 miles; breadth, c. 6000 miles; area, c. 16,819,000 sq. miles. Shape may be described as quadrangular central core, with peninsulas projecting to S., and chain of islands running down E. coast; coast-line irregular; E. coast fringed by Sea of Okhotsk, with Kamchatka peninsula and Kurile Isles outside; Sea of Japan, with Jap. islands outside; Yellow and E. China Seas, with Luchu Isles outside; S. China Sea, with Philippines and Borneo outside. In S., Bay of Bengal and Arabian Sea are respectively E. and W. of India. Eastern Archipelago islands extend S.E. from mainland.

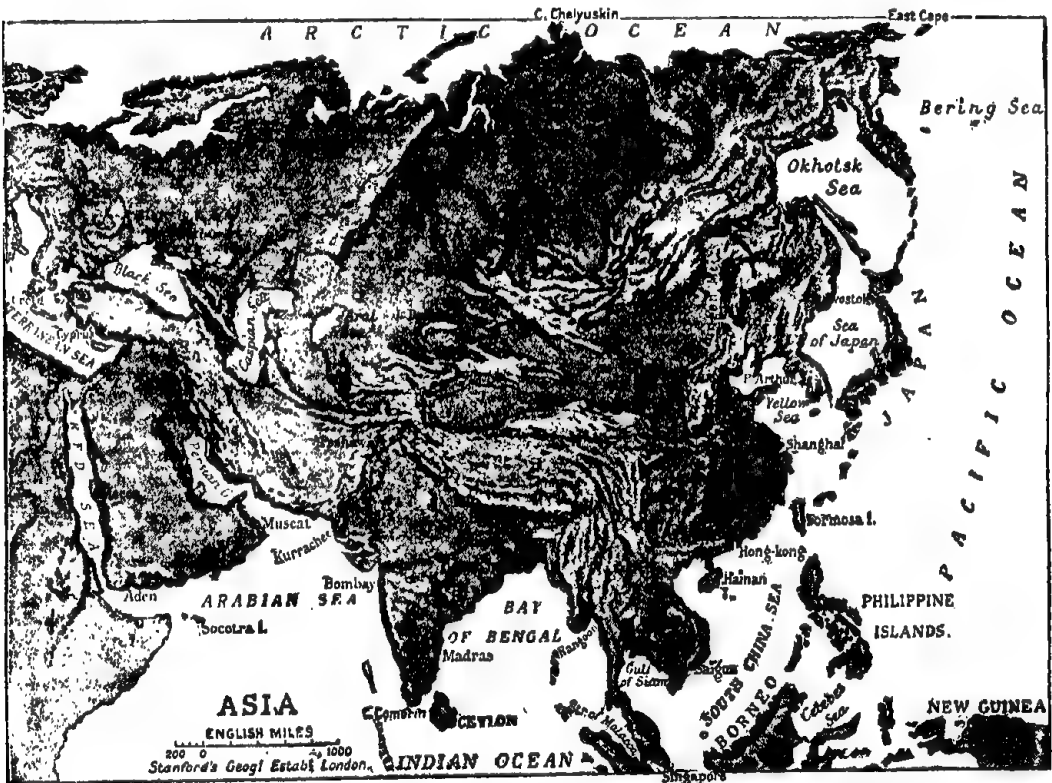
Relief.—In S.W. of continent is plateau called Pamir, where India, Afghanistan, Russ. Turkestan, and China meet, and whence great mountain-chains run in all directions. Principal mountain system is Himalayas—highest point, Mt. Everest (29,002 ft.); chief range extends S.E. from Pamir to borders of China, there breaking into numerous ridges which stretch across China proper, Tibet, Burma, Malay Peninsula; while Kuen-Tun in N. Tibet is northern flank of system. Tian-Shan Mountains extend N.E. from Pamir to Mongolia; further N., Altai and other ranges extend eastwards across N. Mongolia and E. Siberia towards Sea of Okhotsk, forming northern boundary of Desert of Gobi, eastern boundary of which is formed by Great Khingan Mountains. Mountain ranges also extend from Pamir S.W. through India and Afghanistan and W. towards Caspian. Tableland of Tibet, elevation 10,000 to 17,000 ft., lies N. of principal range of Himalayas, to S. of which is Ind. peninsula with tableland of Deccan (1500 to 3000 ft.). In S.W. is tableland of Arabia (2500 to 7000 ft.). Other plateaus are those of Iran, Armenia, and Asia Minor. Principal rivers are Hoang-Ho and Yang-tse-Kiang in S.E.; Irrawadi, Cambodia, Salween, Brahmaputra, Ganges, Indus in S.; Euphrates and Tigris in S.W.; Sir Daria and Oxus (Amu Daria) in W. Largest lake is Caspian Sea, partly in Europe; farther E. is Sea of Aral, still farther E., Lake Balkash. Lake Baikal is a large lake in S. Siberia, and Job Nor a lake in centre of continent which receives rivers of E. Turkestan. Chief lakes in Tibet, Dangra-Yum Nor and Tengri Nor. There are lowland plains along western Caspian-Obi district; in China, Manchuria, Siam, Lower Burma; in curve formed by valleys of Ganges and Indus in N. India; and in valleys of Euphrates and Tigris.

Climate varies greatly. About Verkhoyansk, in N. of E. Siberia, is coldest part of eastern hemisphere, with mean annual temperature of 2° Fahr. From this warmth gradually increases southward, isotherm of 10° passing roughly E. and W. from Bering Sea to mouth of Obi, of 20° from Sea of Okhotsk to S. end of Nova Zembla, of 30° from N. end of Saghalien to White Sea, of 40° from S. end of Saghalien to St. Petersburg, of 50° from middle of Japan to Sea of Azov, of 60° from S. end of Japan to Cape Baba, of 70° from Hong-Kong to Syria, of 80° (an irregular line) from middle of Philippines to Calcutta, thence round Himalayas, back by Gulf of Cambay, across the entrance of Persian Gulf, and thence westward across middle of Arabia. Winter lines are everywhere curved in centre to S.; summer lines even more curved to N.E., following course of monsoons, which blow from N.E. from Oct. to April, and from S.W. from April to Oct. Rainfall is great in lines where high ground intercepts wet winds, coastal regions and eastern Himalayas having over 90 in. and Indo-China peninsula 75; but there are rainless stretches in Tibet, Mongolia, Desert of Gobi, Baluchistan, and plateau from Persia westwards.

Fauna includes camels, lions, elephants, tigers, bears, wolves, Arctic foxes, ermines, deer, marmots, monkeys, some marsupials (in Malaya), crocodiles, pythons, rhinoceri, cheetahs; pheasants, ptarmigan, guillemot.

Flora.—Vegetation varies according to climate and lat. Chief trees are pine, larch, birch in Siberia, coniferous trees on Himalayas, oak, teak, doodar, sandalwood, palm, in India and Malaya; dwarf willows and birches occur in *tundra* districts, N. of Arctic Circle, where also mosses and lichens are found. Tropical flowers occur on lower Himalayan slopes, rhododendrons higher up. In Syria and Asia Minor flora is Mediterranean in character. Central A. produces vines, olive, fig, apple, and other European fruit trees; Jap. and Chin. vegetation occurs east of Himalayas. In S.E. occur many varieties of indigenous plants, sugar-cane, cotton, pepper, areca, sago, banana, and

History.—Earliest centres of civilisation in A. were Assyria and Babylonia, while China also has a civilisation dating back many cent's before Christian era. In VII. cent. B.C. Persia conquered Assyria and Babylonia, and henceforth held chief power till conquered by Alexander of Macedon, the division of whose kingdom caused wars between Egypt and Syria, these being both ultimately absorbed by Rome. In III. cent. A.D. the Persians struggled against the Romans for supremacy in A., and afterwards continued to struggle against the Byzantine Empire; ultimately destroyed by Muhammadan conquests in VII. cent. Caliphate, established by followers of Muhammad, for some time was chief power in A.; in X. cent. Mahmud of Ghazni established his independence and founded Mogul dynasty in India. Other independent empires were established by Seljuk in A. Minor, and by Othman, founder of Ottoman empire; and caliphate was finally



cocoa-nut palms growing wild here, as well as many fruit trees and drug- and rubber-producing plants. Bamboos are abundant in India. Cultivated plants include tea, in China, Japan, Assam; coffee, in Arabia, S. India, China; cereals, in India and Arabia; rice and maize, in Eastern Archipelago islands; cotton, in China and Arabia; sugar, in China. Date palms and acacias abound in Arabia.

Geology.—A. is considered to be of comparatively recent origin. Chief mountain systems consist mainly of granites; schists occur in Himalayas and Altai mountains, gneiss in Himalayas, volcanic rocks in India and Siberia; much of continent said to have been covered till comparatively recent date by sea, of which Caspian and Aral Seas are traces; Himalayas apparently formed by upheavals occurring after Cretaceous period. Minerals include gold, precious stones, coal, iron; petroleum found in Caucasus, Burma, Sumatra.

overthrown by successors of Jenghiz Khan, conqueror of Central A. and Northern China. Byzantine Empire was overthrown by Turkey, 1453. Since XVI. cent. various European powers have established their influence in A.; Russia conquered Siberia in 1680-84. India, after struggle between France and Britain, was secured by latter in 1765.

Peoples.—Inhabitants of A. form over half population of world; belong to five different groups, Mongolian, Caucasian, Malayan, Dravidian, Negroid; Mongolians, numerically greatest, forming about $\frac{1}{4}$ th of entire population, inhabit China, Japan, Tibet, N. Asia; Caucasians predominate in W. from Afghanistan to Asia Minor, and in India; Malayans in eastern peninsula and Eastern Archipelago; Dravidians in S. India and Ceylon; Negroid peoples in S.E. Asia and Philippine Islands. Other inhabitants are Russians, British, Jews, Arabs. Principal religion is Buddhism, but Hinduism prevails in India, Islam in

Central and Western A. A. was cradle of all great world-religions—Christianity, Muhammadanism, Buddhism, Jewish, and other faiths. Total pop. c. 900,000,000.

Keane, *Asia* (1896); Sievers, *Asien* (1894).

ASIA (Gk. myth.), dau. of Oceanus and Thetis, and bride of Prometheus; gave name to continent.

ASIA MINOR, ANATOLIA (36° to 42° N., 26° to 42° E.), western peninsula, Asia, forming part of Turk. Empire; bounded N. by Black Sea, E. by Russia and Persia, S. by Mediterranean and Syria, W. by Bosphorus, Sea of Marmora, Dardanelles, and Aegean; coast-line broken. Central tableland, bounded by mountain ranges N. and S.; has salt lakes. Elsewhere are fertile river valleys and waste strips; in S. is Plain of Adana. Roads are practically unknown; traffic dependent on horses, camels, mules. Railway mileage is c. 1500 including section of Bagdad or Anatolian Railway, which, running from Scutari, has reached Konia and Bulgurli. Hill slopes are covered with trees—walnut, box, oak, beech, plane, ash. There are many sheep, goats, horses.

Ruling power in A. M. was held by Lydian kings in VII. cent. B.C.; came under control of Persia a cent. later, and was afterwards subdued in 334 B.C. by Alex.

and antipathy is sometimes heightened by disgust at certain forms of disease or crime to which Asiatics are prone.

In older countries where population is large and scope for immigration therefore limited, the problem seldom presents itself, although even in Liverpool anti-Chinese riots are not unknown. In lands like South Africa, Australia, Canada, and U.S.A., however, the case is entirely different; there is not only room but need for immigrants; and there is danger of the white population being swamped by a wholesale invasion of Asiatics. Australia, for instance, has no wish to become the dumping-ground of Japan's surplus population. South Africa has made use of imported indentured coolie labour (Indian and Chinese) owing to its cheapness and suitability to the climate, but has no desire to allow a large body of Asiatics to gain a permanent footing in the country, because the Indian trader can easily undersell his white rival, owing to his business methods and the extreme frugality of his living; besides, the Indian usually sends his savings to India, instead of spending or investing the money where it was made. Hence the adoption in America, Australia, and S. Africa of Immigration Laws, which restrict or exclude Asiatics.

Serious rioting and strained international relations have resulted from anti-Asiatic movements in various countries; in 1906-7, for instance, outbreaks of the kind occurred in San Francisco and Vancouver, and feeling ran high in Japan in consequence. An agitation on humanitarian grounds against the importation (1904 onwards) of Chinese coolies (who lived in 'Compounds') for the Transvaal mines led to their repatriation (last batch returned, 1910). About the same time the Natal Government's attitude towards Indians led to the Indian Government's refusal to allow coolies for Natal plan-



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ander the Great, after whose death it was subdivided, greater part coming eventually to Seleucids, and kings of Pergamum; Rhodes became republic, and Bithynian kingdom was established; flourished under Romans from I. cent. B.C.; less prosperous under Byzantine empire; gradual annexation by Turks began XI. cent.; whole has belonged to Turkey since 1481.

Manufactures include silks, cottons, carpets, mohair, wine, soap, liquorice paste, copper utensils. Among imports are textiles, iron, coal, petroleum, sugar; among exports, wheat, woods, salt fish, barley, millet, sesame, olive oil, cattle, hides, mohair, tobacco, meerschaum, soap, various ores, etc. Area, 197,711 sq. miles. Pop. (recent estimate) 10,500,000, including Turks, Circassians, Jews, Arabs, and other races.

Sir C. W. Wilson's *Handbook for Travellers in Asia Minor*; Ramsay's *Historical Geography of Asia Minor*.

ASIATIC QUESTION.—In many parts of the New World a serious Asiatic question has arisen owing to a rapid influx of Indians, Chinese, or Japanese, who, for one reason or another, have come to be regarded as undesirable immigrants. The main cause of anti-Asiatic feeling is generally to be found in the inability of the white man to compete in the labour and other markets on equal terms with the brown or yellow man;

tations to be indentured in India; while the Transvaal Government's demand that all Indians in the country should have their finger-print taken as means of identification led to a Passive Resistance Movement, Indians considering this an imputation of crime.

Neame, *Asiatic Danger in the Colonies* (1895).

ASIATIC RUSSIA, see RUSSIA.

ASIATIC TURKEY, see TURKEY.

ASIENTO, ASIENTO (Span.), a contract by which the taxes were farmed out. By the 'Asiento' Treaty of 1713, between Spain and Britain, Brit. subjects were allowed to introduce 144,000 slaves into Span. colonies.

ASIO, a genus of Owls (q.v.).

ASIR (19° N., 43° E.), central mountainous district, W. Arabia; divides coastal strip from inner plateau; produces dates, cereals. Pop. c. 160,000.

ASKE, ROBERT, Eng. rebel, became leader of the 'Pilgrimage of Grace,' 1536; at first successful, but rebel force disbanded with promise of royal pardon; A. was executed, 1537.

ASKEW, ANNE (d. 1546), Eng. Prot. martyr; repudiated doctrine of transubstantiation; refused to recant, was racked, and burnt.

ASKHABAD (37° 55' N., 58° 15' E.), town, Russian Central Asia. Pop. 41,700.

ASKEPIOS, see **ÆSCULAPUS**.

ASKWITH, SIR GEORGE RANKEN (1861–), Eng. chief industrial commissioner (1911); held positions under Board of Trade, and settled many trade disputes, including cotton strike (1901) and railway and transport strike (1911); K.C.B. (1911).

ASMAR, town of Afghanistan below the Kunar valley; part of disputed territory annexed, 1893.

ASMARA (15° 10' N., 38° 54' E.), town, Eritrea, Africa; seat of government. Pop. c. 9000.

ASMODEUS, Jew. name (of Persian origin) for a demon referred to in Book of *Tobit* as loving Sara, and the destroyer of her successive husbands; hence he is famous as the spirit which destroys conjugal happiness. He is often referred to by old writers, and figures in Le Sage's *Le Diable Boiteux*.

ASNIERES (48° 55' N., 2° 20' E.), town, on Seine, France. Pop. (1911) 42,600.

ASOKA (fl. 284–228 B.C.), Ind. emperor; adopting Buddhism, he spread its doctrines by missionaries and teachers and by edicts carved on stone pillars and rock; reign marks beginning of stone architecture and sculpture in India.

ASOLO (45° 48' N., 11° 57' E.), town, Venetia, Italy. Pop. 5800.

ASP (*Vipera aspis*), poisonous snake of Mediterranean countries and Alps.

ASPARAGINE (C₄H₈N₂O₆), organic compound occurring in Asparagus and Leguminosae.

ASPARAGUS, plant genus belonging to order Liliaceae. *A. officinalis* cultivated for its edible stems; about a hundred other species occur in temperate parts of the Old World.

ASPASIA (fl. V. cent. B.C.), Greek woman who came to Athens from Miletus, entertained chief men of Athens in her house, won much fame for charm and intellectual gifts, and became mistress of Pericles, who was greatly attached to her; their s. was legitimised. A. was centre of free-thinking circle and vehemently attacked in literature of time, besides undergoing public prosecution.

ASPAZIUS (I. cent. A.D.), Gk. Peripatetic philosopher; wrote commentaries on Aristotle and Plato.

ASPECTS, configuration of planets at any time with reference to their supposed effects for good or evil.

ASPEN (*Populus tremula*), European and Siberian tree with slender leaf-stalks causing 'trembling' of the foliage. *P. tremula* grows in N. America. Bark, containing salicin, is used medicinally. See **POPLAR**.

ASPENDUS (36° 54' N., 31° 13' E.), ancient town, Pamphylia, Asia Minor; remarkable Rom. remains, including fine theatre; site of modern *Balkis Kalé*.

ASPERGES, term for R.C. ceremony of sprinkling congregation with holy water before High Mass.

ASPERGILLUM, see under **LAMELLIBRANCHIATA**.

ASPERN, or **ESSLING**, battle fought between French under Napoleon and Austrians under Archduke Charles, May 1809; after fierce fighting, the French were beaten. A. and E. are villages near Vienna.

ASPHALT, MINERAL PITCH, blackish bituminous deposits formed by drying up of crude petroleum. Trinidad, Dead Sea, and Cuban deposits are exploited for manufacture of roofing felt, coating for floors, and black varnish. A. limestone from Val de Travers (Switzerland) is used as ingredient of concrete for pavements, etc.

ASPHODEL (*Asphodelus*), Mediterranean genus of lilies. Bog A. (*Narthecium ossifragum*) grows on Brit. peat bogs.

ASPHYXIA, cessation of respiration, through obstruction of the entrance of air to the lungs.

ASPIC, Egyptian venomous snake; spikenard plant (*Lavandula spica*); savoury jelly.

ASPIDISTRA, genus of lilies from Far East.

ASPINWALL, WILLIAM H. (1807–75), Amer. engineer; built Panama railroad, E. terminus of which bears his name. See **COLON**.

ASPIRATE (Lat. *aspirare*, to breathe towards).—
(1) Letter *h*, as in *home*, to pronounce which special

expulsion of breath is necessary; distinguished from *h* mute, as in *honour*. (2) In Gk., mark of aspiration (') denotes 'rough breathing.'

ASPIROTRICHA, a group of ciliated Infusorians (see **CILIATA**) among the Protozoa, equivalent to family *Paramacinae*.

ASPIROZ, MANUEL DE (1836–1905), Mexican diplomatist and author.

ASPLANCHNACEE, a genus of ROTIFERA (g.v.).

ASPRMONTE (38° 5' N., 16° 55' E.), mountain, Italy, 6420 ft.; Garibaldi wounded and captured here, 1862.

ASQUITH, HERBERT HENRY (1852–), Brit. statesman; b. Morley, Yorkshire; ed. City of London School and Balliol College, Oxford, where he took a first class in Classics, and was elected a Fellow of his College; proceeded to the Bar, becoming a Q.C. (1890); m. (2nd wife) Margot, dau. of Sir Charles Tennant (1894); entered Parliament as a Gladstonian Liberal for East Fife (1886); Home Sec. (1892–95). After Liberal defeat (1895) helped to found the Liberal League, and identified himself with the imperialistic views of Lord Rosebery. In ministry of Sir H. Campbell-Bannerman was appointed Chancellor of the Exchequer (1905), becoming Prime Minister in 1908 on the resignation of his chief. His administration has been notable for the inauguration of Old Age Pensions, the Parliament Act reducing the powers of the House of Lords, National Insurance, the payment of salaries to members of Parliament, and the introduction of bills for Irish Home Rule, Welsh Disestablishment, and Abolition of Plural Voting (1912); *Life*, by Elias (1909).

ASS (*Asinus*), sub-genus of horse tribe. See **HOASE FAMILY**.

ASSAB (12° 48' N., 42° 40' E.), port and bay, Eritrea, Africa.

ASSAM (26° N., 92° E.), Chief Commissionership in extreme N.E. of India; area, c. 56,500 sq. miles. Northern part lies along Brahmaputra valley, southern along Surma valley; between these two rivers lies hill district; chief mountains, Himalayas in N., Assam hills in S.; large amount of forest ground and fertile land. A. seems to have been independent State in VII. cent., called Kamarupa; conquered by Shans or Ahoms from E. in XIII. cent.; held by them until conquered by Burmese in late XVIII. cent. War between Burmese and British broke out, 1823–24; resulted in cession of A. to British, 1826; incorporated with Eastern Bengal, because of unrest in Bengal, culminating in Swadeshi movement, 1905; separated again, 1912.

A. produces about three-fourths of tea grown in India, plantations covering over 6,000,000 acres; large deposits of coal; petroleum, iron, and limestone also worked; forests contain rubber trees, sal and other hardwoods; produces gold, ivory, amber, lead, mustard, rice, jute, cotton; exports tea, rice, timber, coal; imports woollen and cotton goods, salt, glass, earthenware, tobacco, opium, betel. Animals found include rhinoceros, elephant, tiger, monkeys, porcupines, innumerable kinds of birds, crocodiles, snakes. Inhabitants are dark-skinned and black-haired; majority are Hindus (54 %); a large number of Muhammadans (27 %) and Animists, small number of Christians and Buddhists. Principal dialects are Assamese and Bengali. Chief town, Shillong. Pop. c. 5,000,000.

ASSAMAR, bitter yellow chemical produced by roasting sugar or starch.

ASSAROTTI, OTTAVIO GIOVANNI BATTISTA (1753–1829), Ital. educationist; founder in Italy, under the patronage of Napoleon, of the first school for the training of deaf-mutes.

ASSASSIN, a murderer, hired or otherwise; particularly the murderer of a public person. The name is derived from a secret society of murderers founded in Persia, in 1090, by Hassan ben Sabbah, who seized the fortress of Alamut, where he established the order, making the Sheikh el-Jebel ('old man of

the mountain') the ruler-in-chief. The *fedais*, who were those appointed to carry out the murders, were first intoxicated with a narcotic preparation made from hemp (*hashish*). From Persia branches of the Order of Assassins spread into Syria and Asia Minor, and for two cent's continued their operations. The Crusaders became acquainted with its terrors, and amongst its distinguished victims were Conrad of Montferrat and Count Raymond of Tripoli.

ASSASSINATIONS.—Xerxes I., Artaxerxes III., and Darius III. of Persia were murdered; as were Julius Caesar, the emperors Caligula and Domitian, Edward II. and Edward V. of England, James I. and James III. of Scotland, Henry III. and Henry IV. of France; notable a's in XIX. and XX. cent's are those of Tsars of Russia, 1801 and 1881; U.S. presidents Lincoln, 1865; Garfield, 1881; McKinley, 1901; Fr. president Carnot, 1894; King Humbert of Italy, 1900; Alexander I. of Serbia, 1903; King and Crown Prince of Portugal, 1908; King of Greece, 1913; President Madero, 1913.

ASSAULT, an unlawful attempt to apply force to the person of another, either directly or indirectly. It is also the act of using a gesture towards another, so as to give him reasonable grounds for believing that the person using such gesture meant to use actual force upon him. It includes also the act of depriving another person of his liberty. Common a's are punishable by fine or imprisonment; those which occasion serious bodily harm are punishable by long terms of penal servitude. Any person resisting or obstructing a police officer in the execution of his duty is liable, upon conviction, to two years' imprisonment with hard labour.

ASSAYE (20° 17' N., 75° 50' E.), village, Hyderabad, India; scene of Wellesley's defeat of the Mahrattas, 1803.

ASSAYING, the quantitative determination of metals in ores and alloys, chiefly of iron, lead, copper, tin, mercury, antimony, silver, and gold.

Rhead and Sexton, *Assaying and Metallurgical Analysis* (1902).

ASSEGAI, a light wooden spear, pointed with iron, used by the Zulus and Kaffirs.

ASSEMANI, JOSEPH SIMON (b. 1687), Syrian Orientalist; famous for having edit. and pub. some of most valuable MSS. in Vatican Library, of which he was librarian. He was assisted in this work by his bro., Joseph Aloysius A., and his nephew, Stephen Exodius A. His grandson, Simon A., is remembered for his exposure of the Vella hist. imposture.

ASSEMBLIES (Fr. *assemblée*, assembly, from Lat. *assimulare*, to bring together), fashionable periodical gatherings, still held in provinces; meeting of clerical synods, such as Westminster A. of Divines, General A. of Scottish Church; in Fr. history council summoned by king as A. of Notables; important A. of Notables, 1787-88, advised summoning of States General.

ASSEN (53° N., 6° 34' E.), town, Holland. Pop. 11,300.

ASSENT, ROYAL, to Bills (which then became Acts) of Parliament; given by sovereign in person or by commission; form in public acts, *le roy le veut*; in money acts, *le roy remercie ses bons sujets, accepte leur benevolence et ainsi le veut*; in private bills, *soit fait comme il est désiré*. Veto, not exercised since 1708, took form *le roy s'aviserà*. R. A. is sometimes withheld from Colonial Acts of Parliament.

ASSER, JOHN (d. 910), Eng. ecclesiastic; friend and biographer of Alfred the Great; became bp. of Sherborne.

ASSESSMENT, official valuation of property or income for national or local government taxation purposes; also the amount of damages awarded in a court of law. **Assessor** (Late Lat. *assessor*, or regulator of taxation, by transference of meaning from *assessor*, assistant, from Lat. *assidere*, to sit beside).—(1) Official who assesses taxation. (2) Specialist called in to assist magistrate.

ASSETS, Eng. legal term for the entire property

of a debtor or bankrupt, and the source from which his creditors must receive the whole or partial payment of their claims.

ASSIGN (Lat. *assignare*, to appropriate to), legal term for person to whom property is made over; conveyances in fee simple always made to guarantee his 'heirs, executors, administrators, and assigns.'

ASSIGNATION, to write and evidents and assignation to rents, clauses in Scot. conveyances assigning title-deeds and rents to grantee.

ASSIGNATS, a system of paper money used in France during the years 1790-96, when the National Assembly confiscated the Church lands, for which, when resold, bonds were accepted bearing the above name.

ASSINIBOIA (50° 20' N., 107° W.), former name of territory now included in Saskatchewan (q.v.) province, Canada; a district in Rupert's Land prior to 1870.

ASSINIBOIN, N. Amer. Indians, now in Canada and Montana.

ASSINIBOINE RIVER (50° 12' N., 100° 30' W.), tributary of Red R., Canada; waters the district known till 1905 as Assiniboia.

ASSINIE (5° 5' N., 2° 57' W.), one of chief ports of Fr. Ivory Coast, West Africa.

ASSISE, two adjacent strata of rock containing same fossils.

ASSISI (43° 4' N., 12° 36' E.), cathedral town, Italy; birthplace of St. Francis, 1182; has Franciscan monastery and double church. Pop. 5300.

ASSIUT, STRUT (27° 9' N., 31° 12' E.).—(1) town, Egypt; site of Nile barrage and lock; carved ivory, pottery, leather goods; hospital, mosques. Pop. 39,400. (2) province, Upper Egypt; area, 772 sq. miles. Pop. 907,435.

ASSIZE COURTS, courts of justice held several times each year in every county. The King's Commission to hold the a. is issued to His Majesty's Judges, one of whom usually presides, but it may be directed also to some King's Counsel, or other barrister, who then, if need be, takes the place of the judge. The Commission is in several parts, the united effect of which is to empower the judge to try treasons and felonies, to clear the jails of all prisoners, and to try all civil causes. For the purpose of holding the a's the country is divided into eight circuits, viz.: the Western, Northern, Midland, Oxford, North-Eastern, South-Eastern, North Wales, and South Wales. London and Middlesex are not included in the circuit system. Civil cases are tried in the High Court of Justice, and criminal cases at the Central Criminal Court ('Old Bailey').

ASSMANNSHAUSEN (50° N., 7° 53' E.), village, Prussia; noted wine.

ASSOCIATES, clerks of the Supreme Court who prepare cause lists, record judgments, enter verdicts, etc. They are required to be properly qualified barristers or solicitors. It is also the title given to an artist connected with the Royal Academy, below the rank of a Fellow; and in other artistic and learned societies.

ASSOCIATION, see FOOTBALL.

ASSOCIATION OF IDEAS, a term first used by John Locke, and employed, in psychology, to describe the combination of states of mind with one another by what are known as the laws of a. Prominent among these laws are a. by similarity, and by contiguity. This method of logical speculation gave rise to what is known as the *Associationist school*, some of its principal later members being James Mill, J. S. Mill, and Prof. Bain. Associationists held that, given a sensation now, a previous sensation, by the law of similarity, is revived, and this by law of contiguity evokes the ideas that go to make up the object of perception. See **PSYCHOLOGY**.

Bradley's *Principles of Logic*; Stout's *Analytic Psychology*; James Mill's *Analysis of the Human Mind*; J. S. Mill's *System of Logic*.

ASSOILZIE, in Scots law, 'to acquit' (assoil).

ASSOLLANT, ALFRED (1827-86), Fr. author; wrote witty ironical essays and stories: *Aventures du capitaine Corcoran, Histoire fantastique du célèbre Pierrot*, are well known.

ASSONANCE, in Eng. prosody, a correspondence in sound in the termination of verses, less complete than that of rhyme—i.e. the vowels may be the same, but the consonants different. It was a common practice with old Eng. writers, who would rhyme 'stand' with 'man.' In the famous ballad of Sir Patrick Spens, 'deep' is made to rhyme with 'feet.' A. is believed to be a characteristic of Hebrew poetry.

ASSUAN, ASWAN (24° 7' N., 32° 53' E.), town, Egypt; site of dam constructed to form a great reservoir for irrigation in the times of 'low Nile.' The dam measures 1½ mile in length, is nearly 100 ft. thick at its base, with a maximum height from its foundation of about 130 ft.; the greatest difference

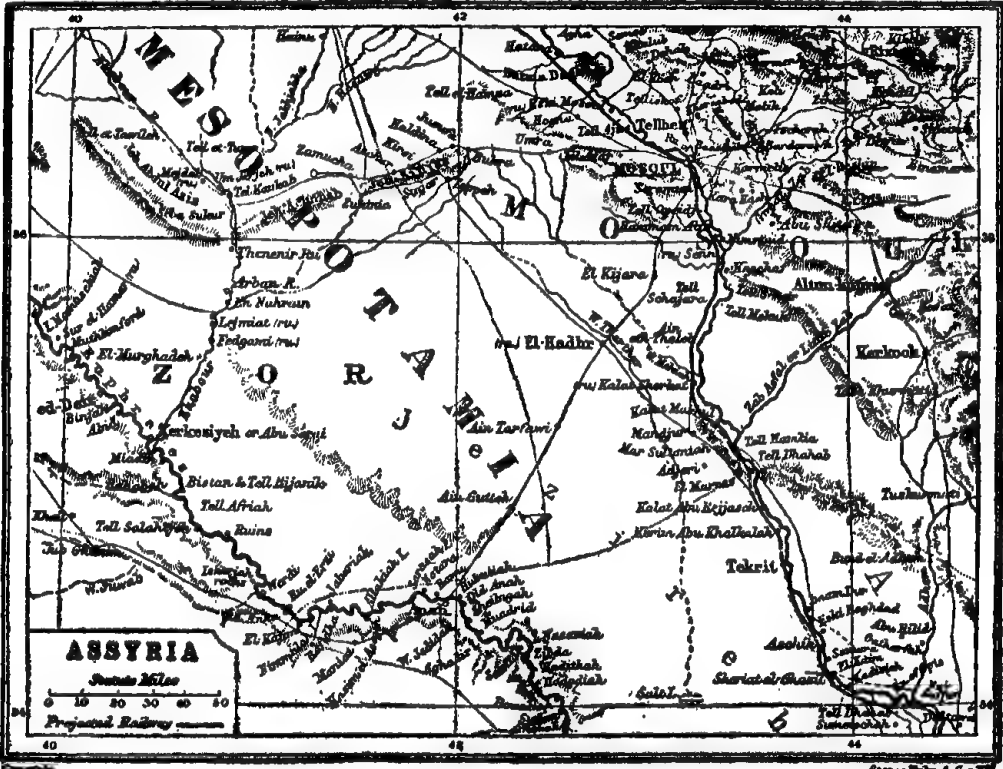
ASSUMPTION ISLAND (9° 44' S., 46° 30' E.), dependent island of Seychelles, Africa.

ASSUR (35° 32' N., 43° 15' E.), original capital, Assyria; site marked by Kalesh Sherghat, on Tigris; also name of god whose temple was there.

ASSUR-BANI-PAL, Assyrian king; after his f.'s death (688 B.C.) he subdued revolted provinces, but lost Egypt (660). His bro. (Babylonian king) declared war, but Babylon was starved into surrender (648 B.C.). When Assur-Bani-Pal d. (c. 626) his empire was already decaying.

ASSUS (39° 28' N., 26° 13' E.), old Gk. town, Asiatic Turkey; belonged successively to Lydia, Persia, Pergamum, Rome, Turkey; modern, Behram.

ASSYRIA (35° N., 44° E.), ancient country lying N. of Babylonia (q.v.) and forming part of Mesopotamia; named from Assur; became one of most extensive empires of ancient world, comprising Babylonia, West Media, Armenia, Syria, Palestine, and



of level of water above and below the dam is about 67 ft. It is built of local granite, set in Portland cement; the total weight of masonry is over one million tons. The dam has 180 sluice openings, through which could pass 15,000 tons of water per second. These sluices are left open when the river is in flood, but when the discharge has fallen to 2000 tons per second, the sluice-gates begin to be closed, and the reservoir—that is, the river above the dam—begins to fill up. When full, the reservoir contains 1000 million tons of water, affecting the depth of the river for 140 miles above the dam. The dam was opened in 1902. Navigation is provided for by a ladder of five locks, each 280 feet long and 32 feet wide. Pop. 12,618. Province, Upper Egypt, area, 169 sq. miles. Pop. 234,600.

ASSUMPTION, FEAST OF, festival (Aug. 15) commemorative of tradition almost universally held (but not of faith) in R.C. Church, that the Virgin Mary's body was assumed after her death into heaven.

Egypt. Surface of country is high plain crossed by mountains and drained by Tigris and tributaries.

History.—Greek account of founding of state and its later capital Nineveh by Ninos (eponymous character), husband of Semiramis, was derived from Persian legends; Bible account of A. as colony of Babylonia is borne out by inscriptions; subject to Babylonia, 2250-1600 (?); succeeding period one of constant strife with Babylonia; c. 1270 B.C. Shalmaneser I., who changed capital from Assur to Calah, greatly increased prestige of A. Tiglathpileser I. gained control of great part of Babylonia, and again made Assur the capital. His successors lost control of Babylonia, which remained independent for several centuries. Ashur-Natsir-Pal III. (883-c. 860) carried out successful campaigns in all directions, subduing Arameans and establishing Assyrian pre-eminence in the East. Nineveh, now capital, increased in splendour with each succeeding ruler. Shalmaneser II., who succeeded Ashur-Natsir-Pal, also carried out successful campaigns, and in following cent.

Tiglathpileser III. became king also of Babylonia. With his successor, Sargon II., Assyrian empire reached its apogee; he again subjugated Babylonia, defeated Hittites, and made Judaea a vassal state. Sennacherib, next king, destroyed Babylon and carried on various wars; his s. Esarhaddon, 680-669, warred against Egypt and was succeeded by his s. Assur-Bani-Pal (king, 668-626), a great soldier who carried on various wars, burning the palace of his rebellious brother in Babylon. After his death Babylonia broke away and A. began to decline; empire ended with destruction of Nineveh by Medes, Babylonians, and Scythians in 607 B.C., after which Babylonia again became centre of empire.

A fine set of Assyrian reliefs and inscriptions are in the Brit. Museum; among them famous relief of Assyrian Tree of Life, with winged figures kneeling on either side, and fighting scenes of bold, graceful, conventional treatment; strong decorative sense; colossal man-headed winged lions from palace at Nineveh are also in Brit. Museum.

H. Winckler, *History of Babylonia and Assyria* (Eng. ed., 1907); L. W. King, *History of Sumer and Akkad* (1910); W. St. C. Boscawen, *First of Empires* (1906).

ASSYRIAN RELIGION, see **BABYLONIA** (Religion).

AST, **GEORG ANTON FRIEDRICH** (1778-1841), Ger. philosopher and philologist; famous for his critical editions of Plato.

ASTARA (38° 30' N., 48° 30' E.), port on the Caspian, Transcaucasia, Russia.

ASTARABAD.—(1) (36° 50' N., 54° 26' E.) walled town, Persia. Pop. c. 11,000. (2) (36° 40' N., 54° 40' E.) province. Pop. c. 90,000.

ASTARAC (43° 30' N., 0° 25' E.), district of France.

ASTARTE, **ASHTAROTH**, or **ISHTAR**, Phœnician goddess, symbolised by the moon; represented the conceptive powers of nature, as Baal the generative. The rites connected with her worship at Tyre and Sidon were of a lascivious nature. A. is often confounded with Venus and other classical deities.

ASTER, genus of composite, generally herbaceous perennial plants, occurring in America, Europe, and Asia, many species being cultivated in gardens, e.g. Michaelmas daisies.

ASTERIA, precious stone, generally sapphire, which, when cut, gives the reflex of a star.

ASTERICELLA FORMOSA, a member of the Diatomaceæ (q.v.), which lives in colonies, the individuals joining like wheel-spokes.

ASTEROIDEA, star-fish. See **ECHINODERMATA**.

ASTHMA, disease characterised by sudden paroxysmal attacks of painful and distressful breathing, recurring at intervals. It is due to narrowing of the bronchial tubes, and previous lung disease, polypi, etc., and a neurotic history predispose to it. Certain atmospheric conditions, dusty particles, and reflex irritation, e.g. from alimentary system, excite attacks. Various inhalations, and lobelia, belladonna, and hyoscyamus are valuable in its treatment, while hypnotism has also been employed with benefit.

ASTI (44° 55' N., 8° 16' E.), town, Italy; birth-place of Alfieri; famous wine. Pop. 19,800.

ASTIGMATISM, see **EYE**.

ASTLEY, **JACOB ASTLEY**, **BARON** (1579-1652), Eng. Royalist leader; commanded the infantry at Naseby.

ASTLEY, **PHILIP** (1742-1814), noted trainer of horses, who held shows at Lambeth, etc.

ASTON MANOR (52° 31' N., 1° 52' W.), town, Warwickshire, England. Pop. (1911) 75,000.

ASTOR, **JOHN JACOB** (1763-1848), Amer. merchant; of Ger. birth; emigrated to America (1783), engaged in the fur trade, and became founder of the American Fur Company; from the profits of this and other undertakings he amassed a large fortune, amounting, it is estimated, to about \$30,000,000. He founded Astor House and the Astor Library, both in

New York City, and more numerous benefactions. William Waldorf A. (1848-) is his grandson.

ASTOR, **WILLIAM WALDORF** (1848-), owner of *Observer* and other papers; liberal patron of education.

ASTORGA (42° 28' N., 6° 6' W.), town, Spain. Pop. 5800.

ASTORGA, **EMANUELE D'** (1681-1736), Ital. composer; known chiefly for his *Stabat Mater*, and a number of chamber cantatas.

ASTORIA (46° 12' N., 123° 48' W.), town, Oregon, U.S.A.; founded by John Jacob Astor, 1811. Pop. (1910) 9599.

ASTOVE ISLAND, dependent island of the Seychelles (q.v.).

ASTRÆA (classical myth.), the goddess of justice; dau. of Zeus and Themis. In the Zodiac she is the constellation *Virgo*, represented as bearing the scales of justice.

ASTRAKHAN (47° N., 46° 40' E.), government, Russia; area, 91,000 sq. miles. Pop. (1910) 1,246,000.

ASTRAKHAN (46° 22' N., 48° 5' E.), river port, on Volga, Russia; trading centre; exports caviare, fish, etc.; gives its name to A. fur (skin of still-born or young lambs); cathedral. Pop. (1909) 149,800.

ASTRAL PLANE, term in theosophy for region in which A. spirits, the spiritual or subconscious members of individualities, have conscious life; terminology borrowed from mediæval astrology.

ASTROID, star of over five points.

ASTROLABE, astronomical instrument for determining altitudes of heavenly bodies, developed from armilla, and superseded by the quadrant and sextant (q.v.).

ASTROLOGY, study of the motions of heavenly bodies and their supposed influence on terrestrial events and human affairs. The science and art were first practised by the Chaldeans in Babylonia and Assyria, who spread their knowledge to Egypt. The ancient Greeks, and even more the Romans, were convinced of the possibility of divining the future by consulting the constellations. Arabian astrologers flourished in spite of much opposition by the orthodox Christian Church, and a. continued to exercise great influence on European scientists and statesmen until Copernicus (q.v.), by proving definitely that the earth is not the centre of the universe, gave the impetus which severed the science of the stars, astronomy (q.v.), from the still persistent art of astrology. Though more and more discredited, the latter has its votaries even at the present time, who, for a consideration, draw horoscopes and cast nativities.

G. Wilde, *Chaldean Astrology up to date* (1901).

ASTRONOMY, the science that treats of the heavenly bodies, and especially of their movements, real or apparent. Their daily movement in the direction east to west, the most obvious and the first observed, is an apparent motion caused by the rotation of the earth upon its axis. The next movements observed were those of the sun and moon among the stars; the former being an actual movement, but the latter apparent only, due to the revolution of the earth round the sun in the course of a year. The first practical use made of these movements was the measurement of *Time*—the rotation of the earth giving the *day*; the phases of the moon the *month*; and the apparent revolution of the sun the *year*. Five planets or 'wandering stars' were also noted amongst the host of *fixed stars*, and from about 600 B.C. up to the time of HIPPARCHUS (190-120 B.C.), Gk. astronomers made great efforts to reduce their seemingly irregular motions to some orderly system, it being first assumed that sun, moon, and planets must all move round the earth in circles at uniform speed. As this theory did not agree with observation, it was supposed that it was not the planet itself that moved in a circle round the earth, but the centre of another circle, and that the planet travelled in this latter *epicycle*, as it was termed. But this did not account for all these irregularities, and

the first epicycle had to carry a second, and that a third. This system was named the 'Ptolemaic,' from CLAUDIUS PTOLEMY, who gave it its final development (137 A.D.).

COPERNICUS (1473-1543) showed that a great simplification could be secured by supposing the sun fixed and the earth and all the planets to revolve round it. KEPLER (1571-1630) found that the planets moved in *ellipses*, not circles, round the sun, which occupied one of the *foci*, and that the straight line joining the planet to the sun, the *radius vector*, passed over equal areas of space in equal periods of time. Further, that the cube of the distance of any planet bore in every case the same proportion to the square of the time of its revolution. These are known as Kepler's Three Laws, and SIR ISAAC NEWTON (1642-1727) proved that they are a consequence of a single universal law of *Gravitation*—that every particle of matter attracts every other particle with a force varying inversely as the square of the distance between them, and directly as the product of the two masses. He further proved that a body travelling under the influence of this law must revolve in one of four closely allied curves, known as *conic sections*, of which the circle and ellipse are two.

The most brilliant triumph of gravitational astronomy was achieved in 1846, when the seventh great planet, *Neptune*, was discovered from the computations of ADAMS and of LEVERRIER, who had independently predicted its position from the irregularities in the motion of *Uranus*, the sixth planet. This last had been discovered at the telescope by SIR WILLIAM HERSCHEL in 1781. Other members of the solar system are *Asteroids*, very small planets of which several hundreds are now known; and *Comets*, the most famous of which is called after HALLÉY, since he first proved that it was moving in a regular orbit round the sun, in a period of about seventy-six years. Many other comets are now known to belong to the system, and closely connected with them are *Meteors*, or 'shooting stars,' so called because, when they encounter the earth, they become luminous as they rush through our atmosphere.

Before the telescope was invented at the beginning of the XVII. cent. only five planets were known: *Mercury*, *Venus*, *Mars*, *Jupiter*, and *Saturn*. GALILEO (1564-1642) added to these four *satellites* revolving round *Jupiter*, and two strange appendages to *Saturn* which Huygens showed to be a *Ring*. *Mars* is now known to have two satellites, *Jupiter* eight, *Saturn* ten, *Uranus* four, and *Neptune* one. The telescope has also enabled the surfaces of the sun, moon, and planets to be studied, creating a new department of astronomy, that dealing with their physical condition. Of these the sun is most important; its *photosphere* or luminous surface is diversified by dark *spots* and bright *faculae*, subject to a cycle of change about eleven years in length. A total eclipse shows the sun to be surrounded by the *chromosphere*, a coloured shell of bright gases, from which rise the red flames or *prominences*; and the whole is surrounded by the *corona*.

Stellar astronomy began about 2700 B.C., when the ancients, to distinguish the stars one from another, associated them with certain imaginary forms, grouping them into *Constellations*. Hipparchus made the first catalogue, giving the celestial longitudes and latitudes of 1080 stars. Much more accurate positions were obtained after the invention of the telescope, the chief purpose then in view being the advancement of the practical art of *Navigation*. Star catalogues are now continually in the course of preparation at the chief National Observatories, and an International Photographic Chart is in course of preparation which will exhibit about 30 million star images.

Stellar astronomy has developed in several directions: viz., the study of *Variable Stars*, i.e. those that change their *magnitude*—that is, their brightness; of *Double Stars*, where two or more are evidently associated together, including *binaries* or double stars, where one is seen to be revolving round the other; of *Star*

Clusters; and of *New or Temporary Stars*, that appear suddenly and rapidly fade away. The telescope has also shown *Nebulae*, masses of faint filmy light, some *irregular* and extended, some small with defined outlines and known as *planetary nebulae*, and an immense number of *spiral nebulae*. Stellar distribution offers another subject of inquiry, for stars are not equally distributed, but are congregated most in the belt of the *Milky Way*. The *proper motions* of stars have shown that the sun, with all its planets, is moving rapidly in the direction towards the neighbourhood of the bright star Vega, and companies of stars have been found to show a common *Drift*.

The measurement of astronomical distances is effected through the principle of *parallax*, i.e. the apparent displacement of a body due to a real change in the position of the observer. Thus, by observing the moon from the observatories of Greenwich and of the Cape, her distance has been found to be 239,000 miles. The distances of several asteroids have been determined in like manner, and from these the distance of the sun—about 93 millions of miles—has been inferred. The distances of the stars are inferred from their *annual parallax*, that is, by observing them from opposite ends of the earth's orbit, and the parallaxes of about 50 are approximately known. The nearest star, *Alpha Centauri*, is distant about 280,000 times as far as the sun.

Science of the Stars, MAUNDER (1912); *Practical Astronomy*, MAOPHERSON (1912); *History of Astronomy* (1907), BRYANT.

ASTROPALIA (36° 35' N., 26° 25' E.), island, Aegean Sea; produces sponges.

ASTROPHYSICS, science of the physical and chemical constitution of heavenly bodies; grew into a distinct branch of astron. (q.v.), owing to the introduction of spectroscopy and the advance in photography and photometry.

ASTRUC, JEAN (1684-1766), Fr. physician and theologian; editor of a work on venereal diseases, *De Morbis Venereis* (1736); and (anonymously) a volume of *Conjectures* (1753), relating to sources of information used by Moses in compiling *Book of Genesis*.

ASTUR, Goshawk; see HAWK FAMILY.

ASTURA (41° 25' N., 12° 46' E.), peninsula, Italy; formerly island.

ASTURIAS (43° 15' N., 5° 55' W.), old province, Spain, which in early times maintained independence against Moors; area, 4200 sq. miles; surface mountainous, rising to height of c. 9000 ft. in S.; chief town, Oviedo; cereals, fruits, horses; well-wooded. Pop. (1910) 688,000. The heir to the Span. throne takes the title Princes of A.

ASTYAGES (d. 550 B.C.), last Median king.

ASTYANAX (Gk. myth.), s. of Hector and Andromache; prophecy that he would avenge destruction of Troy led Greeks to throw him over ramparts.

ASUNCION (25° 16' S., 57° 42' W.), capital, Paraguay; trades in leather, tobacco, sugar. Pop. (1910) 84,000.

ASUR, ASHUR, ASIRA, see ASSUR.

ASYLUM, a sanctuary, or place of refuge, from which persons could not be dislodged except by committing an act of sacrilege. The word is now generally applied to homes for the insane. See INSANITY. **Asylum**, Right of, the privilege of a country, or state, to give protection to fugitives from another country, or state, which of late years has been protected from abuse, to a great extent, by extradition treaties.

ASYMPTOTE (Gk. 'not meeting'), straight or curved line which approaches curved line without meeting it in finite distance; purely mathematical conception.

ASYNDETON (Lat., from Gk. 'unconnected'), term of rhetoric for sentence or phrase in which conjunction is absent; redundancy of conjunctions is *polysyndeton*.

ASYNJUR (sing. Asynja), goddesses of Norse celestial region, *Asgard* (q.v.).

ATACAMA (27° S., 70° W.), province, Chile; area, 30,720 sq. miles. Pop. (1910) 65,600. *Atacama*, Desert of (24° S., 70° W.), mountainous region rich in minerals.

ATACAMITE ($\text{Cu}_2\text{Cl}(\text{OH})_2$), green soft mineral crystallising orthorhombically, decomposition product of copper ores, found in Chile, S. Australia, and W. Africa.

ATAHUALPA, became Inca of Peru (1532) by dispossessing his bro. Huascar, who had succ. his f. Huayna Capac (1527), when A. had received Quito; during Span. conquest he was treacherously captured, and subsequently strangled (1533) by Pizarro's orders.

ATALANTA (classical myth.), Gk. maiden famed for her beauty and her fleetness of foot. Not being desirous to marry, she challenged her suitors to a race, death being the penalty of defeat. Hippomenes (Milanion in Arcadian version), one of those, won the race by dropping at intervals three golden apples given him by Aphrodite. A. stopped to pick them up, and so was outstripped by her lover.

ATARGATIS, a Syrian divinity, generally represented as a siren. In Kingsley's *Andromeda* she is spoken of as 'queen of the fishes.'

ATAULPHUS (d. 415), king of the Goths.

ATAVISM, unsatisfactory term, now abandoned, for reappearance in an individual of a character typical of a remote ancestor. See *HEREDITY*.

ATBARA (16° 50' N., 35° 20' E.), river, Africa; joins Nile; on the north bank Lord Kitchener defeated the Mahdists, April 8, 1898.

ATCHEIN, see *ACHIN*.

ATCHISON (39° 33' N., 95° 8' W.), town, Kansas, U.S.A. Pop. (1910) 16,429.

ATE (classical myth.), the goddess of discord and all evil; dau. of Zeus, by whom she was flung out of Olympus by the hair, and left to dwell upon earth, where she incited mankind to all manner of wickedness.

ATELIERS NATIONAUX, Fr. provisional government, 1848, in order to relieve economic distress, established national workshops (*ateliers nationaux*) by which every man was to be provided with work; experiment failed disastrously; the workshops were abolished within the year, and system of outdoor relief for destitute established in its place.

ATELLA (40° 52' N., 15° 38' E.), ancient town, Campania, Italy.

ATELLANÆ FABULÆ, name of a form of satirical comedy popular among the early Romans, in which personal foibles, and the follies of the day, were pilloried under thin disguises.

ATESSA (42° 4' N., 14° 28' E.), town, Abruzzi, Italy.

ATESTE (45° 12' N., 11° 40' E.), ancient city, Italy; modern Este.

ATH, AATH (50° 38' N., 3° 46' E.), town, Belgium. Pop. 11,200.

ATHABASCA, ELK (50° 20' N., 109° W.), lake, Canada, and (57° 20' N., 111° 38' W.) river, Canada.

ATHABASCA, TERRITORY OF, former division of Canada (area, 240,000 sq. miles); divided, 1905, between Alberta and Saskatchewan (q.v.).

ATHALARIC (516-534), king of Ostrogoths.

ATHALIA, Old Testament character, queen of Juda; dau. of Ahab and Jezebel; m. Jehoram, whose children she killed in order to obtain throne; of traditional cruelty; subject of Racine's great play *Athalie*.

ATHAMAS (classical myth.), king of Thebes; m. Nephele, the cloud-goddess, whom he repudiated, and afterwards m. Ino, dau. of Cadmus, for which he was inflicted with madness by Hera.

ATHANARIC (d. 381), Visigothic general.

ATHANASIUS, ST. (293-373), bp. of Alexandria (328); sided actively against Arius in Arian controversy; his refusal to readmit Arius to communion ultimately caused his banishment (335); returned (337), but was deposed on religious and political grounds (339). Although pronounced guiltless by the

Great Council of Synod at Rome (340), he was not restored till 346. On three further occasions he suffered exile, but from 366 he continued his episcopal labours uninterruptedly. He left several writings. A zealous defender of the Nicene faith, of heroic if imperious character and great intellectual powers, his title, 'Father of Orthodoxy,' is deservedly owned.

Bush, *Athanasius*.

ATHANOR, automatic furnace used in experiments on digestion; maintains constant temperature.

ATHAPASCAN, scattered stock of N. Amer. Indian tribes.

ATHARVA VEDA, 4th Vedic book.

ATHEISM, term applied to disbelief in God, though often used vaguely and as term of abuse flung at those whose belief is different from the conventional; an agnostic, strictly a pure sceptic, should be distinguished from an atheist who definitely denies.

ATHELNEY (51° 3' N., 2° 56' W.), district, Somersetshire, England; formerly island; Alfred found safety here, 879.

ATHENA, PALLAS-ATHENE (classical myth.), one of the chief Olympian deities, called by Romans Minerva. No satisfactory explanation of name Athena, or Athene, is known, and Pallas is variously derived from name of a giant slain by A., from shield which she carried and used to swing about her (*pallo*, I swing) to ward off antagonistic influences, or from Attic district of Pallene, which was one seat of her worship. She is said to have sprung fully armed from head of Zeus, who had swallowed her mother, Metis, then pregnant. She was protector of heroes in war, patron of arts of peace, and guardian deity of city of Athens, which was probably named after her. The Parthenon, at Athens, was her chief temple, and contained world-renowned statue by Pheidias. The owl, the cock, and the serpent were sacred to her, as also was the olive tree.

ATHENÆUM, name given originally to buildings dedicated to the worship of Athena; later, a place where poets and scholars used to meet for reading purposes, and to instruct their pupils, such an institution having been built at Rome by the Emperor Hadrian. In modern times it is a name given to many clubs and literary institutions, and forms the title of a well-known literary journal.

ATHENÆUS, Gk. rhetorician, who lived about time of Commodus (II. cent.), and wrote *Diepno sophista*, a dialogue containing a vast amount of information upon a great variety of subjects connected with social life. (Eng. trans. by Yonge in Bohn's Class. Library.)

ATHENAGORAS, writer of *Embassy concerning the Christians* (c. 177 A.D.), defending Christians against charges made against them, and attacking paganism.

ATHENODORUS CANANITES (74 A.C.-7 A.D.), Stoic philosopher; friend of Strabo; tutor to the Emperor Augustus, over whom he retained a lasting influence.

ATHENRY (53° 18' N., 8° 44' W.), town, Galway, Ireland.

ATHENS (37° 58' N., 23° 44' E.), capital, Greece, situated on small stretch of flat ground N.W. of Gulf of Ægina, between rivers Ilissus and Cephissus; 4½ miles by rail from its harbour at Piræus. Of recent years its industries—spinning of coarse cotton yarns, manufacture of coarse cotton cloths, making of silk and morocco leather—have been increasing in importance. Principal modern buildings are royal palace, Gk. cathedral, academy, museum, observatory, univ., theatre, library. There are Eng., Fr., Ger., and Amer. Institutes of Archaeology, founded respectively in 1883, 1846, 1874, and 1882. Modern town lies to N. of Acropolis. Pop. 167,479.

Ancient Athens was built on several low hills rising from Attic plain. Interest of old town lies chiefly in *Acropolis*, which was hill in centre of city. Summit was occupied by many of finest

buildings of world, some of which are wonderfully preserved. Near centre is *Parthenon*, chief temple of Athene, and finest example of Doric arch., built in V. cent. B.C. Architects were Ictinus and Callicrates; whole was under supervision of Pheidias, sculptor of chryselephantine statue of Athene, which formerly stood in the cella. Pediment groups are now among Elgin Marbles in Brit. Museum. Much of it was destroyed by shell explosion, 1687. *Erechtheum*, to N. of *Parthenon*, is finest example of Ionic architecture, and has beautiful Caryatids. The *Propylaea*, or great entrance hall, stood at western end, and was faced by colossal bronze statue of Athene, by Pheidias. Other buildings were temple of *Athene Niké* (often called Wingless Victory), which has been reconstructed; and an old temple to Athene near *Erechtheum*, of which traces remain. Round base of *Acropolis* were many temples and other buildings, among which may be mentioned the Temple of *Æsculapius*, the Theatre of *Dionysos*, and the Odeum of *Herod Atticus*. In the city were also the *Theseion* and the *Hephestæum*, respectively east and west of *Agora*, or market-place, which in early and classical times was centre of municipal life; the Temple of *Olympian Zeus*, S.E. of *Acropolis*, and the Monument of *Lysicrates*. Traces of prehistoric civilisation have been revealed by excavations, such as rock tombs and dwellings, early fortifications on *Acropolis*, and parts of wall built round citadel and called *Pelasgicum*.

History.—The state of A. was traditionally founded by *Theseus*, c. XIII. cent. B.C., and ruled by kings until c. 1100 B.C., afterwards by archons. In IV. cent. B.C. *Archon Solon* remodelled the constitution, laying foundations of future prosperity. *Solon's* constitution was practically set aside by *Peisistratus*, who ruled with great splendour and success as tyrant, 560–527. His sons *Hippias* and *Hipparchus* also ruled as despots; latter murdered, former expelled in 510, after which *Cleisthenes* framed a democratic constitution, 508–7. Then various wars occurred, of which most important were those against Persia. Athenians defeated Persians at *Marathon*, 490, at *Salamis*, 480. In latter year city was destroyed by *Xerxes*, but was presently rebuilt, surrounding walls being raised by *Themistocles*. About this time A. became leader of *Hellenist* league against Persia, and became imperial state. Time of greatest glory was in second half of V. cent. B.C., when, under leadership of *Pericles*, chief power in Greece was acquired, and maritime supremacy established; this period was also marked by highest development of culture; plays of *Euripides*, *Aristophanes*, *Sophocles* produced; *Parthenon* built; sculpture found its highest expression in works of *Pheidias*. *Peloponnesian War* broke out, 431; ultimate result was conquest of Athens by *Lacedæmonians*; city taken by *Lysander*, 405; ruled for short time by oligarchy of thirty, who were overthrown by *Thrasybulus*, and democracy restored, 403; again flourishing for time; formed alliance with *Thebes* against *Sparta*, 378, and again became most powerful state in Greece; opposed Philip of *Macedon* in *Phocian War*, after which war between A. and *Macedon* broke out; defeated at *Charonea*, 338 B.C., and lost independence; politically unimportant till Rom. conquest, 146 B.C.; city, which had retained independence, ultimately taken by *Sulla*, 86 B.C.; prospered under *Hadrian*; twice invaded by *Goths*, 267 and 395 A.D.; unimportant under *Byzantines*; became Latin lordship, 1204; duchy, 1258; given to *Frederick of Aragon*, king of Sicily, 1312; taken by *Nerio Acciajuoli* of Corinth, 1385; by *Turks*, 1458; remained under *Turks* till 1833, when became capital of independent kingdom of Greece.

Gardner, Ancient Athens (1902); *Wordsworth, Athens and Attica* (1869).

ATHENS (33° 53' N., 83° 22' W.), town, Georgia, U.S.A.; educational centre. Pop. (1910) 14,903.

ATHEROMA, type of arterial fatty degeneration; also a wen.

ATHERSTONE (52° 34' N., 1° 31' W.), town, Warwickshire, England. Pop. 5300.

ATHERSTONE, WILLIAM GUYBON (1813–98), S. African geologist; medical practitioner in Grahamstown; his discovery of diamond-bearing formations near *Vaal River* and *Kimberley* encouraged establishment of diamond industry.

ATHERTON, CHOWBENT (53° 31' N., 2° 30' W.), town, Lancashire, England. Pop. (1911) 19,000.

ATHETOSIS, slow, rhythmical, and involuntary movements of the hands and feet, and of their fingers and toes, which are widely separated and hyperextended; due to a brain lesion, frequently caused by injury to the head at birth.

ATHLETICS.—Athletic sports were practised in various forms by the ancient Egyptians, and were brought to a high standard of development by the ancient Greeks. In Great Britain they have been cultivated since Celtic times, different varieties of sports being in favour at different periods. Athletic sports in the modern sense were instituted by the Royal Military College at Sandhurst in 1812; in 1866 the Amateur Athletic Club held the first of a series of championship meetings, continued from 1880 by the Amateur Athletic Association, which is the chief authority in athletic sports. The recognised sports to-day include the 100 yards, 440 yards, 880 yards, 1 mile, 3 mile, 4 mile, 10 mile runs; 120 yards hurdle-race; high and long jumps, and pole-vault; throwing the hammer; and putting the weight.

One of the most important developments in athletic sports has been the revival of the *Olympic Games*, which were first instituted in Greece about the VIII. cent. B.C., and abandoned about the IV. cent. A.D. They were reinstituted as international athletic sports in the reconstructed ancient stadium at Athens in 1896, and have since been held every four years, at Paris (1900), St. Louis, U.S.A. (1904), London (1908), Stockholm (1912), and are arranged to be held in Berlin in 1916. Except at London in 1908 British athletes have never taken any great share in these games, and at Stockholm, in 1912, they took a particularly inglorious position in the prize-list. It has been evident for some years, however, that the British athlete—and the British public—is not so much interested in athletic sports of this type as in team games, such as football and cricket (q.v.), in which the individual strives not for himself but for his team. In U.S.A., A. are governed by the Amateur Athletic Union (1888), founded, 1880, as National Association of Athletics of America. Track and field sports have been adopted so enthusiastically that at Stockholm the U.S. team scored more than double the points of any other country, took 16 firsts, 12 seconds, and 13 thirds in the Stadium games, and made 8 of the 13 new records.

ATHLONE (53° 26' N., 7° 56' W.), town on Shannon, Westmeath, Ireland; fisheries, sawmills, woollen mill; agricultural centre; thrice besieged; burnt by *Cromwell*. Pop. 6600.

ATHOL (42° 35' N., 72° 14' W.), township, Massachusetts, U.S.A. Pop. 7200.

ATHOLL, ATHOLE (56° 47' N., 3° 55' W.), district, Perthshire, Scotland.

ATHOLL, EARLDOM AND DUKEDOM OF, Scot. titles; Sir John Stewart of Balveny (d. 1512) was cr. Earl of A. (c. 1457); the Stewart line of earls ended 1595, and a new line (the Murray line) began 1629. The 2nd earl in this line, John Murray (1631–1703), became Marquess of A. (1678); m. dau. of 7th Earl of Derby (hence later dukes of A. obtained sovereignty of Isle of Man). John Murray, 2nd marquess (1660–1724), became Duke of A. (1703).

ATHOS (40° 20' N., 24° 10' E.), peninsula, Turkey in Europe; extends into *Ægean*, connected with mainland by narrow strip of land; canal was made here by *Xerxes*, c. 480 B.C.; ends in conical peak,

Mt. A. (6778 ft.); remarkable for religious establishments; monastic republic since 1060; now has 21 monasteries and about 6000 monks; plundered after fall of Constantinople, 1204; revived under Palaeologi; pays tribute to Turkey; MSS., frescoes, mosaics.

ATHY (53° N., 6° 59' W.), town, Kildare, Ireland. Pop. 3600.

ATITLAN (14° 40' N., 91° 14' W.), town, Guatemala, Pop. c. 9000.

ATIU (WATERO) (20° S., 158° 10' W.), one of Cook Islands, New Zealand. Pop. 811.

ATJEH, see **ACHIN**.

ATKINSON, SIR HARRY ALBERT (1831-92), Brit. farmer, financier, and statesman; b. Chester; became Prime Minister of New Zealand.

ATLANTA (33° 45' N., 84° 21' W.), capital (since 1868) of Georgia, U.S.A.; besieged and burnt in Civil War; educational centre—medical school, Georgia School of Technology, Coll. of Physicians, etc.; Clark and A. Univ's for negroes; public buildings include State Capitol, court-house, library, opera-house, etc.; railway centre; chief trading and manufacturing town in State; produces cottons, lumber, machinery, cigars, chemicals, woollens, bricks, flour, fertilisers; exports horses, mules, cotton, grain, etc. Pop. (1910) 154,839.

ATLANTES (Gk. pl. of *Atlas*, q.v.), architectural term for sculpture of human beings put to columnar uses; more generally known as caryatids.

ATLANTIC (41° 24' N., 95° 2' W.), town, Iowa, U.S.A. Pop. (1910) 4560.

ATLANTIC CITY (39° 22' N., 74° 25' W.), town, New Jersey, U.S.A.; popular seaside resort. Pop. (1910) 46,150.

ATLANTIC OCEAN, ocean separating Old from New World, Europe and Africa lying to E., N. and S. America to W.; opens northward into Arctic Ocean; spreads out southward into great Southern Ocean, with extreme length of c. 7000 miles along part enclosed by land; greatest breadth, c. 5000 miles; narrowest part, between Brazil and African coast, 1600 miles. Area has been variously computed at from 24,000,000 to 30,000,000 sq. miles. Deepest point, just North of Virgin Islands, which lie E. from Porto Rico, has depth of 4561 fathoms. Bed crossed by number of telegraphic cables, connecting Ireland with Newfoundland and Nova Scotia; France with Newfoundland and Boston; London with Lisbon, Madeira, Cape Verde Islands, and Pernambuco; Senegal with Brazil; Africa with Teneriffe and Europe; S. America with W. Indies and United States. See **OCEAN**, **GULF STREAM**.

ATLANTIS, mythical island kingdom, which according to tradition was situated in Atlantic, W. of Pillars of Hercules; rich and extensive; finally engulfed by sea.

ATLAS (classical myth.).—(1) One of the Titans, bro. of Prometheus and Epimetheus, led the war against the gods, for which he was condemned by Zeus to bear the heavens upon his shoulders; f. of the Hesperides, Pleiades, and Hyades. Another legend makes A. a king who refused shelter to Perseus; the latter turned him into a mountain by exposing to his view the head of Medusa. (2) Name given by Mercator to a collection of maps.

ATLAS MOUNTAINS (32° N., 6° W.), irregular series of mountain groups running along N. of Africa from Cape Nun in Morocco to Cape Bon in Tunis, distance of about 1400 miles. Greatest height, between 14,000 and 15,000 ft., is near W. end, S. of city of Morocco; from this point eastward elevation steadily falls to little over 7500 ft. in Algeria, c. 4500 ft. in Tunisia, and c. 2300 ft. in Tripoli. Hills are covered with pine, oak, poplar, and olive forests in N., W., and S.

ATMAN (Skrt.). Hindu term for soul; used by pantheists to mean universal soul.

ATMOLYSIS, separation of mingled gases of different densities by means of their different rates of diffusion (q.v.) through a porous medium.

ATMOMETER, instrument for measuring rate of evaporation from a wet surface.

ATMOSPHERE, gaseous envelope surrounding a heavenly body, in the earth possibly to height of 200 miles; air pressure at sea-level, or at 760 mm. of mercurial barometer, 14.7 lb. per sq. inch. Air is a mixture, not a compound, averaging 77.12 % nitrogen, 20.66 % oxygen, c. 1.4 % aqueous vapour, c. 0.79 % argon, 0.03 % carbon dioxide, and traces of hydrogen, krypton, neon, xenon, and helium, besides dust. See **METEOROLOGY**.

ATOLL, coral island enclosing a central lagoon, very common in the Pacific Ocean. The shape is something like that of a horseshoe, the opening to the lagoon being on the leeward side.

ATOMS, the ultimate particles or elements of matter, which have been held to be indivisible. It would be theoretically possible to divide by mechanical means limestone, for instance, into fine particles, which could not physically be divided any further, but chemically these particles are shown to be of a composite nature, and may be divided into the three constituents—calcium, carbon, and oxygen, which at present cannot be converted into other forms of matter. Moreover, when these constituents or a's combine to form compounds, they always do so in definite proportions by weight that are characteristic of the compound. If two or more elements combine to form more than one compound, they combine in simple multiples of these definite weights (Dalton's laws). Modern physico-chemical researches, especially in radioactivity, have intensely modified the current views on the integrity of the a., and tend to prove the ultimate unity of matter. A's would have to be regarded as centres of electrical force, and it seems that it will ere long be possible to prove definitely the possibility of converting elements of high atomic weight into others of lower weight, at least in the same group of the periodic system (Sir W. Ramsay). See **CHEMISTRY**, **ELEMENTS**, **RADIOACTIVITY**, **STOICHEMISTRY**.

ATON, god of sun's face. See **EGYPT**.

ATONEMENT, involves the idea that man is somehow alienated from God and needs to be reconciled. Jewish 'Day of Atonement' one of most important annual observances. In Christian theol., doctrine of a. has taken various forms. Some said Christ paid 'ransom' to Satan; according to others 'ransom' was paid to God, or sacrifice was within Divine nature itself; Christ being infinite was able to satisfy for human sin, which, on account of the Being sinned against, was also infinite.

ATOSSA (fl. VI.-V. cent. B.C.) Persian queen, dau. of Cyrus, and successively wife of Cambyse, Smerdis, and Darius Hystaspis; Sapphic reputation.

ATRATO (7° 30' N., 77° 5' W.), river, W. Colombia, S. America.

ATREK (37° 55' N., 56° E.), river, Persia; enters Caspian.

ATREUS (Gk. myth.), king of Mycenae, whose descendants were known as *Atrides*; s. of Pelops and Hippodamia, and f. of Agamemnon and Menelaus; slew children of bro. Thyestes, to whom he served them up as food, and drew down curse on his race; slain by *Egisthus*, s. of Thyestes.

ATRI (42° 34' N., 13° 50' E.), town, N. Italy. Pop. 13,500.

ATRIUM, name given by the Romans to the great central hall in their dwellings, which was the reception and living-room, and contained the household gods, etc. A space in the centre of the roof was open to the sky, and in the floor beneath was a marble basin into which the rain water drained.

ATROPHY, wasting of a part or the whole of the body, essentially due to impairment of nutrition; may be practically physiological, e.g. thymus gland after birth, and uterus after parturition; more usually due to disease, malnutrition, or obstruction of blood supply.

ATROPIA or **ATROPINE**, DATURINE, $C_{17}H_{23}NO_3$,

alkaloid in berry of deadly nightshade and thorn apple (*Datura stramonium*); crystals, M.P. 115.5° C., mydriatic (i.e. dilates pupil of eye), very poisonous; is the tropine ester of tropic acid. See TROPINE.

ATROPOS (classical myth.), one of the three Fates, or 'Fates.' Clotho wound the flax on the distaff, Lachesis spun the threads, which, in turn, were cut by the 'abhorred shears' of Atropos.

ATTACAPAN, N. Amer. Indian linguistic family; dialect spoken by the almost extinct Atakapa.

ATTACHMENT (legal term), any person who has obtained a judgment or order for the recovery or payment of money may apply to a Court or a judge for an order that all debts owing to or accruing to the judgment debtor shall be attached to answer the judgment or order. If the Court makes such an order, then the person who owes the judgment debtor any sum is called the 'garnishee.' The latter is summoned to appear before the Court to show cause why he should not pay the money owing to the judgment creditor for the purpose of satisfying the judgment debt. The garnishee may either admit or dispute the debt, but even if he admits it he should not pay the money to the judgment creditor until he has received the order of the Court.

ATTAINDER, BILL OF, a means of reaching offenders whom the ordinary process of law, or an impeachment, would probably fail to touch, for want of legal proof or some other technicality. A bill is brought in and has to pass through both Houses of Parliament, declaring that the accused has been guilty of treason in certain acts. The accused is then allowed to defend himself before both Houses. If the bill passes, and receives the sovereign's assent, the ordinary consequences of a conviction for treason follow. The last instance of the passing of a bill of a. in England was that against Lord Edward Fitzgerald, a principal in the Irish rebellion of 1798.

ATTANT, WRIT OF, instrument issued against members of a jury who were believed to have given a false verdict, but the usage is now practically obsolete.

ATTALUS, name of three kings of Pergamum. A. I., SOTER (king, 241-197 B.C.), assisted Romans against Philip of Macedon. His s., A. II., PRITADELPHOS (159-138), received Roman aid against Prusias of Bithynia. A. III., PHILOMETOR (138-132), made Rome his heir.

ATTAR, or **OTTO OF ROSES**, perfume of essential oil of roses, prepared in Bulgaria, Persia, and India.

ATTENTION, making ready to apprehend any object (of perception, thought, etc.). See PSYCHOLOGY.

ATTERBOM, PER DANIEL AMADEUS (1790-1855), Swed. poet; author of a romantic drama, *The Fortunate Island*, but chiefly famous for his lyrical work, which reached a high standard of excellence.

ATTERBURY, FRANCIS (1662-1732), Eng. politician, writer, and bp. of Rochester; b. at Milton, Bucks; royal chaplain, 1691; supported High Church party in controversies of 1700; dean of Carlisle, 1704; prominent in trial of Sacheverell, whose defence is attributed to him, 1710; dean of Christ Church, Oxford, 1711; administered affairs badly; bp. of Rochester, 1713. After accession of George I. plotted in favour of Pretender; he was arrested, imprisoned, stripped of dignities, and finally exiled; d. in Paris, and was buried, privately, in Westminster Abbey.

ATTESTATION, act of testifying, or bearing witness to anything.

ATTIC, something pertaining to Attica, in Greece; hence, 'A. muse,' Xenophon, famed for his simple and elegant style; 'A. salt,' the quality of delicate wit; 'A. taste,' used by Milton in reference to the elegance of Gk. poetry; 'Atticism,' term used to describe an elegant composition in any language, but more particularly in ancient Gk. The word is also used by moderns to describe the top storey of a dwelling.

ATTIC BASE, term used in arch. for the moulded

base of a column, consisting of an upper and lower torus, separated by a scotia and two narrow fillets.

ATTICA (38° 15' N., 23° 25' E.), eastern division, ancient Greece, in form of triangle, one side of which is separated from Boeotia by mountains, while other two are washed by Aegean Sea; chief rivers, Ilissus, Cephissus; capital, Athens (q.v.); chief mountains, Cithæron and Parnes ranges. Surface consists of series of plains separated from each other by mountain ridges; plains are the Athenian, which stretches from sea to Parnes range and has Hymettus in E., famed for blue marble, and in N.E., Pentelious, which has white marble quarries; and the plains of Eleusis in S.W., Megara in W., and Marathon in N.E. A. produces olives, grapes, figs. Laurium, famed in ancient times for silver mines, now produces lead, manganese. Climate is almost perfect. A. formed monarchy with Boeotia till 1809, since when it has been separate department, including Megaris, Egina, Salamis, Makronisi. Area, 2474 sq. miles. Pop. 341,200.

ATTICUS HERODES, TIBERIUS CLAUDIUS (101-77 A.D.), Gk. rhetorician; app. by Antoninus Pius tutor to Marcus Aurelius; was possessed of great private wealth, which he devoted to the erection of public buildings, of which the Odeum, a theatre, at Athens, still exists.

ATTICUS, TITUS POMPONIUS (109-32 B.C.), Rom. patron of learning; was the intimate friend of Cicero, who addressed many letters to him.

ATTIGNY, town, Ardennes, France; residence of Fr. kings from time of Clovis; scene of Wittekind's baptism (786), and penance of Louis le Débonnaire (822).

ATILIA (c. 406-53), king of the Huns, known as the 'Scourge of God'; s. of Mundzuk; reigned jointly with his bro. Bleda after succeeding their uncle Rhuas (434); put Bleda to death (444), and afterwards reigned alone. His original kingdom (modern Hungary and Transylvania) he greatly extended; he overran Greece, Thrace, and Macedonia, and made himself virtually supreme in central Europe; invaded Gaul (451), but was defeated with great slaughter near site of Châlons-sur-Marne by Romans under Aëtius, and the Visigoths under Theodorio. In the following year he devastated northern Italy, threatened Rome, which was only saved from destruction by the appeal of Pope Leo I., and died on the night of his marriage with the Princess Hilda of Burgundy.

Gibbon's *Decline and Fall*; Thierry's *Attila*.

ATTLEBOROUGH (52° 31' N., 1° 1' E.), town, Norfolk, England. Pop. (1911) 8381.

ATTOCK (33° 54' N., 72° 10' E.).—(1) town, Punjab, India. (2) district; area, 4022 sq. miles. Pop. 464,400.

ATTORN, to make over something to another; to agree to new ownership.

ATTORNEY-AT-LAW, Amer. name for solicitor; obsolete in England since 1873. Attorney-in-fact (one having 'power of a.') is a proxy, or agent, deputed to transact the business affairs of another absent person.

ATTORNEY-GENERAL, in England and Ireland the head legal official who is charged with the management of affairs in which the Crown is interested—formerly known as 'King's Attorney'; a member of House of Commons, selected by party in power; receives a salary of £7000 per annum, besides fees; since 1895 prohibited from accepting private practice. A similar official in Scotland is known as the Lord Advocate. In U.S.A. the A.-G. is a member of the Cabinet, and administers Department of Justice.

ATTORNMENT, the act of agreement by a tenant that he holds his property of a new landlord.

ATTRACTION.—Newton pointed out (in 1687) that all bodies exert an attractive force upon one another, which varies according to the mass and distance.

ATTRITION, sorrow for sin through fear of the involved penalties.

ATTWOOD, THOMAS (1765-1838), Eng. composer, organist of St. Paul's Cathedral (1798), and

composer to the Chapel Royal; his services, anthems and glees achieved considerable popularity.

ATTWOOD, THOMAS (1783-1856), Eng. politician; advocated franchise and currency reform.

ATWOOD, GEORGE (1746-1807), Eng. mathematician; invented machine for measuring uniform acceleration of motion; F.R.S., Copley medallist.

ATYS, ARTIS (classical myth.), a beautiful youth beloved by Rhea, the mother of Zeus and other Olympian gods. Having incurred the anger of the goddess, he fled from her presence and slew himself. Rhea (also known as Cybele) and A. were afterwards worshipped together in Phrygia and Rome.

AUBADE, name given to a song in welcome of the dawn by the Fr. troubadours; called by the Ger. minnesingers *Tagedied*.

AUBAGNE (43° 18' N., 5° 34' E.), town, S. France. Pop. 6000.

AUBAINE, DROIT D', Fr. feudal term; right of overlord to escheated estates of aliens.

AUBANEL, THÉODORE (1829-86), Provençal playwright and poet; member of Provençal literary association, *Félibrige*.

AUBE (48° 19' N., 4° 10' E.), department, France. cereals, vegetables, wines; cattle raised; watered by Seine and A.; area, 2328 sq. miles. Pop. (1911) 240,700.

AUBENUS (44° 36' N., 4° 24' E.), town, S. France; silk industry. Pop. 3976.

AUBER, DANIEL FRANÇOIS ESPRIT (1782-1871), Fr. composer; his operas achieved world-wide popularity, and include: *Maometto* (1828), *La Fiancée* (1829), *Fra Diavolo* (1830), *Le Domino Noir* (1837), *Les Diamants de la couronne* (1841), and about forty others.

AUBERGINE, BRINJAL (*Solanum melongena*). annual plant cultivated in Italy and France for its purple or white (egg-plant) edible fruit.

AUBERVILLIERS (48° 55' N., 2° 20' E.), town, on Seine, France. Pop. 33,300.

AUBIGNAC, FRANÇOIS HÉDELIN, ABBÉ D (1604-76), Fr. dramatist and author; was some time tutor to the Duc de Fronsac, a relative of Cardinal Richelieu; was author of four dramas: *La Cyminde* (1642), *La Pucelle d'Orléans* (1642), *Zénobie* (1647), and *Le Martyre de Sainte Catherine*; and a treatise, *Pratique du Théâtre* (1657), laying down the 'Unities.'

AUBIGNE, AGRIPPA D' (1552-1630), Fr. poet and historian; famous for his *Mémoires*, his great epic, *Les Tragiques*, and his *Histoire universelle*. Inured to arms as a boy, he became one of the most conspicuous figures of his time, and took part in most of the military operations of that period. Blunt in manner and bitter in his speech, he frequently defied Catherine de' Medici and Henry III., was the trusted friend and counsellor of Henry of Navarre, and himself remained firm in the Huguenot religion up to the time of his death.

Macdowall's *Henry of Guise and other Portraits* (1898).

AUBIGNÉ, CONSTANT D' (d. 1647), s. of Théodore Agrippa d'A. (q.v.); f. of Mme de Maintenon; was an unscrupulous adventurer.

AUBIGNÉ, JEAN HENRI MERLE D' (1794-1872), Swiss divine, of Huguenot family; lived in Switzerland, Germany, and England; wrote *Histoire de la Réformation*, etc.

AUBREY, JOHN (1626-97), Eng. antiquary; s. of a Wiltshire country gentleman; dissipated his estates; supplied Anthony à Wood with much quaint information for the latter's *Athenæ Oxonienses*. His only completed work was the *Miscellanies*, pub. 1696, dealing with the subject of ghosts and dreams.

AUBRIOT, HUGUES (d. 1382), Frenchman who caused erection of Bastille.

AUBURN—(1) (44° 7' N., 70° 14' W.) town, Maine, U.S.A.; manufactures boots. Pop. (1910) 15,064. (2) (42° 55' N., 76° 35' W.) town, New York; textiles, rope. Pop. (1910) 34,668.

AUBUSSON (45° 57' N., 2° 10' E.), town on Creuse, France; notable for artistic carpet-weaving. Pop. 6476.

AUBUSSON, PIERRE D' (1423-1503), Fr. soldier and cardinal; grand master of Order of St. John of Jerusalem; forcibly extirpated Judaism in Rhodes.

AUCASSIN ET NICOLETTE, famous old Fr. romance in prose and verse by unknown author; date early XIII. cent.; pub. in Eng. by A. Lang, Laurence Housman, and Bourdillon.

AUCH (43° 38' N., 0° 33' E.), cathedral town, on Gers, France; manufactures leather, tools; trades in cottons, woollens, wine, brandy; archiepiscopal palace, museum. Pop. 9300.

AUCHINLECK (55° 29' N., 4° 22' W.), Scot. village, 1 mile N. of Old Cumnock, Ayrshire. Near are A. House, seat of Boswells, and Aird's Moss, important in history of Covenanters.

AUCHMUTY, SIR SAMUEL (1756-1822), Brit. general; served in India and Egypt.

AUCHTERARDER (56° 18' N., 3° 42' W.), town, Perthshire, Scotland; manufactures tartans.

AUCHTERMUCHTY (56° 18' N., 3° 14' W.), royal burgh, Fifeshire, Scotland; linen-weaving, scales.

AUCKLAND (36° 52' S., 174° 46' E.).—(1) Seaport, N. Island, New Zealand; splendid harbour; fine public buildings, parks; shipbuilding, sugar works. Pop. (1911) 40,500; with suburbs, 102,700. (2) Provincial district, N.Z. Area, 25,746 sq. miles. Pop. (excluding Maories) (1911) 264,500.

AUCKLAND ISLANDS (50° 25' S., 166° 7' E.), volcanic islands, Pacific; uninhabited.

AUCKLAND, GEORGE EDEN, EARL OF (1784-1849), Gov.-Gen. of India (1835-41).

AUCKLAND, WILLIAM EDEN, 1ST BARON (1745-1814), Brit. lawyer and politician; Under-Sec. of State (1772); Chief Sec. for Ireland (1780); Vice-Treasurer of Ireland (1783); friend of Pitt.

AUCTION is the method of disposing of property or goods to the highest bidder. The projected sale having been duly advertised, the Auctioneer, on the day appointed, 'puts up' the various lots, or articles, and they are duly 'knocked down' to the person offering the highest price. Frequently the vendor places a reserve price upon his property or goods, and if this amount is not reached by those bidding, the property is withdrawn. In what is termed a *Dutch auction*, goods are offered at a particular figure, and subsequently reduced until a buyer is found. The Scot. term for auction is 'roup,' and the conditions of the sale are known as 'articles of roup.' By an Act of 1845 an auctioneer is required to provide himself with an annual licence, costing £10, and the penalty for trading without such a licence is £100.

AUCUBA JAPONICA, Jap. laurel with red berries; male and female flowers on separate plants.

AUDE (43° 12' N., 3° 13' E.), river, France; enters Gulf of Lyons.

AUDE (43° 3' N., 2° 30' E.), department, France; cereals, wine, fruit; distilling, quarrying, paper-making; drained by A.; area, 2448 sq. miles. Pop. (1911) 300,600.

AUDEBERT, JEAN BAPTISTE (1759-1800), Fr. miniature-painter and naturalist, who pub. *Histoire des Colibris*, etc., and several other works on birds.

AUDHUMLA (Norse myth.), cow formed from frost; suckled Ymir.

AUDINCOURT (47° 30' N., 6° 50' E.), town, Doubs, France.

AUDIT, an examination of the accounts of any concern to see if they truly represent its position.—**Auditor**, a person who examines the accounts of a business so as to ascertain its exact financial position. The law now requires that the accounts of local governing bodies be audited, as must also accounts of all bodies entrusted with public funds. The mere fact that an a. certifies accounts to be correct, and that books have been properly kept, is no guarantee

that business has been prudently managed, or that its funds have been judiciously expended or invested. It is only in the case of local authorities that a certificate is a guarantee that the funds have not been improperly expended.

AUDLEY, SIR JAMES (d. 1386), Eng. military leader under Black Prince; one of founders of Order of the Garter.

AUDLEY, THOMAS AUDLEY, BARON (c. 1488-1544), Eng. Lord Chancellor; chancellor of duchy of Lancaster and speaker of House of Commons (1520).

AUDOUIN, JEAN VICTOR (1797-1841), Fr. entomologist; investigated parasites of vine and mulberry.

AUDRAN, EDMOND (1842-1901), Fr. composer; his light comic operas are as well known in London as in Paris, and include *The Great Mogul*, *The Mascotte*, *La Cigale*, and *La Poupée*.

AUDRAN, GERARD (1640-1703), Fr. engraver; celebrated for his engravings of Le Brun's 'Battles of Alexander,' 'Stoning of Stephen,' and 'Constantine's Battle with Maxentius.' He stands in the front rank of Fr. engravers, and was a member of a family which for several generations was distinguished in the same line.

AUDREY, ST., see *ÆTHELDREDA*.

AUDUBON, JOHN JAMES (1780-1851), Amer. naturalist; pub. large work on *Birds of America*.

AUE (50° 35' N., 12° 44' E.), town, Saxony; machinery. Pop. 17,100.

AUENBRUGGER VON AUENBRUGG, LEOPOLD (1722-1809), Austrian doctor who discovered method of detecting lung complaints by percussion of chest.

AUER, ALOYS (1813-69), Austrian state printer and author of books on printing; ennobled as Ritter von Welsbach.

AUERBACH, BERTHOLD (1812-82), Ger. novelist; achieved success in 1837 with a novel founded on the life of Spinoza; later became widely known for his stories dealing with the peasantry of the Black Forest.

AUERSPERG, distinguished Austrian family originally from A. near Laibach in Swabia; prominent from XV. cent. when Engelhard was made hereditary imperial marshal and chamberlain.

AUERSPERG, ANTON ALEXANDER, COUNT VON (1806-78), Austrian poet (pseudonym, *Anastassius Grün*) and ardent Liberal.

AUERSTADT (51° 6' N., 11° 34' E.), town of Weimar, S.W. Germany.

AUFIDENA (41° 42' N., 14° 3' E.), old Samnite city, Italy, where tombs and buildings have been excavated; situated on two hills; near modern Alfedena.

AUFKLÄRUNG (Ger. enlightenment), watchword of philosophic movement of XVIII. cent. See *DEISM*, *RATIONALISM*, etc.

AUFRECHT, THEODOR (1822-1907), Ger. philologist; prof. at Edinburgh, 1862-75, Bonn, 1875-89; authority on Sanskrit and tongues of Umbria; pioneer of comparative philology.

AUGEAN STABLES (classical myth.), stables of Augeas, king of Elis, Greece; contained 3000 oxen and remained uncleaned for thirty years; one of 12 labours of Hercules to cleanse them in a day was performed by turning rivers Alpheus and Peneus through them.

AUGEREAU, PIERRE FRANÇOIS CHARLES, DUKE OF CASTGLIONE (1757-1816), Fr. general; b. Paris; served in Russian, Prussian, Neapolitan, and Fr. armies; distinguished himself under Bonaparte; became marshal (1804). He was deprived by Louis XVIII. of military title and pension.

AUGHRIM, AGRIM (53° 18' N., 8° 18' W.), village, Galway, Ireland. At A. in 1691 the forces of James II. were defeated by those of William III.

AUGIER, ÉMILE (1820-89), Fr. playwright;

from appearance of *Le Ciguë* (1844) successful writer of comedies, some of which (e.g. *Le Gendre de M. Poirier*) are still acted; polished, ironical depicter of society.

AUGITE (CaMgSiO₃, with aluminium and iron silicates), a mineral of the pyroxene order similar to hornblende and composed of such igneous rocks as basalt, greenstone, and porphyry; found in rhombic crystals; composed of silica and magnesia, and generally of a dark green colour; varieties: diopside, sahlite, malacolite, and coccolite.

AUGMENTATION as technical term: (1) (XVI. cent.) addition to revenues of crown from dissolved monasteries; this led to A. Office and Court of A. (established 1536 to settle disputes as to title). (2) (Heraldry) Additional charge to coat of arms to assume which crown grants licence. (3) (Music) Extension of original theme in composition. (4) Process of A. in Scot. Court of Teinds is action brought by minister to obtain increase of stipend.

AUGSBURG (48° 22' N., 10° 54' E.), cathedral town, Bavaria; built by Augustus, 15 B.C.; interesting old buildings—churches, Fugger Haus; textiles, paper, chemicals; associated with Reformation. Pop. (1910) 102,500. Augsburg, Confession of, Prot. manifesto drawn up by Luther, Melancthon, and others, 1530, and presented to Charles V. at A.; met by Papal *confutatio* to which Melancthon replied; its acceptance basis of Schmalkaldic league; one of sources of Eng. Thirty-nine Articles. Augsburg, war of the League of, European war (1688-97), between the Emperor, Spain, Sweden, and other states combined against Louis XIV.; ended with Peace of Ryswick.

AUGURS, members of a college of Roman soothsayers. The order is said to have been founded by Romulus, and lasted until the IV. cent. A.D. In early times it consisted of three members, but this number was gradually increased, until in the time of Julius Cæsar there were sixteen a's, and this number continued under the later emperors. The duty of the a. was the interpretation of signs and portents—thunder and lightning, the movements of comets and shooting stars, the flight of birds, etc. His observations were made within a rectangular space (*templum*), after prayer, and in the presence of a magistrate. The a's insignia consisted of a peculiarly knotted staff, and a toga bordered with purple and bearing scarlet stripes.

AUGUST, month of, named after Roman emperor Augustus; previously called 6th month (*Sexilis*). Roman year commencing (as did English till 1752) in March; 31st day added by Augustus.

AUGUSTA (33° 27' N., 81° 52' W.), town, Georgia, U.S.A.; trading centre; cottons, lumber, fruits, cotton-seed oil, flour, vegetables; has fine parks, hospitals, Federal building, medical school; popular health resort; founded 1736 by Oglethorpe; twice taken by British during war of independence. Pop. (1910) 41,040.

AUGUSTA (44° 20' N., 69° 45' W.), capital, Maine, U.S.A.; manufactures paper, etc. Pop. (1910) 13,211.

AUGUSTA (37° 13' N., 15° 13' E.), port, Sicily. Pop. 15,000. Near A. Admiral De Ruyter, commanding the combined Span. and Dutch fleets, defeated the French under Duquesne.

AUGUSTALES.—(1) Officials in Roman empire who performed rites of deified emperors. (2) Gold coins struck by Emperor Frederick II. in the Two Sicilies (1197-1230).

AUGUSTINE, ST. (d. 612-14), Apostle of England, sent by Pope Gregory I.; landed at Thanet, 597; converted Ethelbert of Kent; made abp. of Canterbury, 601.

AUGUSTINE, ST., OF HIPPO (354-430), one of the greatest Christian saints; a. of a Christian mother, Monica, but himself a pagan till 387. His conversion to Christianity was the result of a gradual process. Always searching for truth, he could not be contented with Manichæism. He passed through

not only intellectual and spiritual but moral conflicts, and had great struggles before he could give up a sensual life. His experiences influenced his passionate temperament, and have left their mark through his writings on subsequent Christian theol. His works are very voluminous, but some stand out—his *Confessions*, wherein he recounts his own experience; the *De Civitate Dei*, in which he repels the attacks on Christianity made by paganism; his *De Trinitate* and commentary on St. John. He was the great opponent of Pelagianism. His work has probably had a larger influence on the Church than that of any other single saint or theologian; *Regula B. A.*, a rule of life drawn up by A., formed the basis of the constitutions of many mediæval religious orders.

Migne, *Patrologia*; Swete, *Patristic Study*; Harnack, *Monasticism and Confessions of St. Augustine*.

AUGUSTINIAN or AUSTIN FRIARS, strict order of mendicant friars; till 1250 in isolated congregations, then united into Order; once very numerous on Continent, few in England.

AUGUSTOVO (53° 50' N., 22° 58' E.), town, Russ. Poland. Pop. 12,700.

AUGUSTULUS, ROMULUS, last Rom. emperor of the W.; diminutive A. sign of contempt; deposed 476 by Odoacer.

AUGUSTUS, title, meaning 'the revered,' first bestowed by Roman senate (27 B.C.) on Gaius Julius Cæsar Octavianus, 1st Roman emperor, and afterwards adopted by all succeeding Roman emperors, whence the title *Augustan History*, given to a chronological series of imperial biographies, from Hadrian to Carinus, the work of 6 authors (not collaborators), written professedly during reigns of Diocletian and Constantine. Original documents, both genuine and spurious, are cited in the work. In the age of Theodosius the lives were seriously interpolated.

AUGUSTUS CÆSAR (63 B.C.—14 A.D.), reputed 1st Roman emperor (though Cæsar, towards the end of his life, assumed and wielded imperial power). Gaius Julius Cæsar Octavianus was s. of Gaius Octavius and Atia, niece of Julius Cæsar; his f. died whilst the boy was still young; adopted by his great-uncle (Cæsar) as his son, and subsequently declared his heir; sent to Apollonia by him to be educated under Apollodorus, where he was when news reached him of Cæsar's murder (44 B.C.); went to Rome and professed republican principles; took up arms against Antony, whom he defeated at Mutina; subsequently threw in his lot with Antony and Lepidus, and formed the triumvirate (43 B.C.). In conjunction with Antony, A. defeated Brutus and Cassius at Philippi (42 B.C.). Differences subsequently arising between the triumvirs, the Empire was divided, A. taking the W., Antony the E., and Lepidus receiving Africa. A. destroyed the power of Sextus Pompeius (36 B.C.), deposed Lepidus, and making war on Antony, who had repudiated his wife, Octavia (sister of Augustus), defeated him at Actium (31 B.C.). He now became supreme ruler of the entire Roman Empire, but restored the form of the republic, and achieved marked popularity by his reform of abuses, and in particular by his reform of the administration of the provinces. His later years were marked by brilliant victories in Asia, Spain, Gaul, and other places, but his army suffered a crushing defeat under Varus, in Germany (9 A.D.). Besides being one of the greatest statesmen the world has seen, A. did much to improve and beautify Rome. It was said that he found the city built of brick and left it built of marble. He was deified after death. His period is known as the 'Augustan Age,' and amongst the great authors who adorned it were Vergil, Horace, Ovid, Tibullus, Livy, and others. (The title has also later been given to the age of Queen Anne in England; and that of Louis XIV. in France.)

Firth's *Augustus Cæsar*, 'Heroes of the Nations' Series; Shuckburgh's *Life of Augustus*.

AUGUSTUS I. (1620–86), elector of Saxony; belonged to Albertine branch of Wettin family; m.

dau. of king of Denmark (1548); succ. his bro. Maurice as elector (1553). Desire to cultivate friendship of Hapsburgs and maintain peace between contending religious parties actuated his policy. Hostility between Albertines and Ernestines troubled him till his defeat of John Frederick (1567). He enlarged his territories, and was a politic, enlightened, economical ruler.

AUGUSTUS II., KING OF POLAND (1670–1733); became elector of Saxony (as Frederick Augustus I.), 1694; secured election to Polish throne (1697); deposed after defeat by Charles XII. of Sweden (1702); recovered Poland after *Poltava* (1709). His aim was to make Poland hereditary monarchy, and weaken power of Saxon nobles.

AUGUSTUS III. (1696–1763), king of Poland; known also as Elector Frederick Augustus II. of Saxony.

AUGUSTUSBAD (c. 51° 12' N., 13° 35' E.), spa, Saxony.

AUKS (*Alicia*), family of diving sea-fowl with short wings; the great a. or garefowl recently extinct; a.'s eggs about same size as a swan's, yellowish white with black markings, are highly prized by collectors, and have realised as much as 300 guineas each.

AULA REGIS (Lat. 'hall of the king'), assembly of tenants-in-chief; also called *curia regis* (q.v.).

AULD LICHTS (Old Lights), stricter members of Scot. Presbyterian Church.

AULIC COUNCIL, a standing court erected by Maximilian I. (1497–98), entirely under his control, to act as a supreme administrative and judicial body; at first matters pertaining to hereditary principalities were referred to it, but this practice was discontinued (c. 1558).

AULIE-ATA (43° 3' N., 71° 30' E?), town, Russ. Turkestan. Pop. 12,000.

AULIS (38° 26' N., 23° 35' E.), port of Bœotia in ancient Greece; excavations.

AULNOY, MARIE CATHERINE (1650–1705), Fr. writer of fairy tales, travel books, and popular history. Lady Ritchie published a version of *The Fairy Tales of Madame d'Aulnoy* in 1892.

AULOS, ancient Gk. musical instrument somewhat after the style of the modern clarinet; the name was sometimes given to the pan-pipes.

AULUS GELLIUS, see **GELLIUS, AULUS**.

AUMALE (49° 46' N., 1° 42' E.), town, Seine-Inférieure, France; glass, steel.

AUMALE, HENRI EUGÈNE PHILIPPE LOUIS D'ORLÉANS, DUC D' (1822–97), Fr. administrator; fourth s. of King Louis Philippe; served with distinction in Algeria, becoming governor (1847); inspector-general of army (1879).

AUMONT, ancient Fr. family prominent in history during several centuries.

AUNDE.—(1) (17° 35' N., 74° 23' E.) Native state, Bombay, India; area, 447 sq. miles. Pop. 64,000 (2) Town. Pop. c. 3500.

AUNE (Fr. from O. Fr. *alne*), Fr. measure corresponding to Eng. ell; still survives despite metric system.

AUNGERVILLE, RICHARD (1287–1345), Eng. scholar; called **RICHARD DE BURY**; tutor to Prince Edward (afterwards Edward III.); ambassador at Avignon, 1330–33; dean of Wells, 1333; lord treasurer, 1334; lord chancellor, 1335; famous as collector of books and MSS.; wrote *Philobiblon*, 1345; *Liber Epistolaris Ricardi de Bury* may be his.

AURA, peculiar feeling, taking different forms, such as shivering or nausea, which persons subject to epileptic fits experience immediately before an attack; electrical discharge causing air current.

AURANGABAD, AURUNGABAD (19° 54' N., 75° 15' E.).—(1) town, Hyderabad, India. Pop. 36,800. (2) district; area, 6172 sq. miles. Pop. 721,400. (3) division comprising four districts: A., Parbhani, Nander, and Bhir.

AURANGZEE, AURUNGZEE (1618–1707), great Mogul emperor of Hindustan; seized throne by craft

(1658), imprisoning his f., and procuring assassination of two bro's. His empire was wealthy and extensive, but internally decaying and threatened by growing Mahratta power. After his death, during an expedition which he had undertaken against the Mahrattas, the great empire rapidly disintegrated.

AURAY (47° 40' N., 2° 59' W.), town, France; leading centre of sardine and other fisheries; scene of famous battle (1364); church of St. Anne is place of pilgrimage. Pop. 5200.

AURELIAN, L. DOMITIUS AURELIANUS (c. 214-275), Rom. emperor; general of Emperor Claudius II.; succ. him as emperor, 270; ended Gothic war, resigning Dacia to Goths; secured Rhine and Danube frontiers; destroyed Zenobia's monarchy; assassinated. A. was warlike monarch; he restored unity of empire, and began the rebuilding and enlargement of the walls of Rome, a task completed after his death. **Aurelian Way**, Via AURELIA, old high road, Italy; starting from Rome, it ran northwards along the coast through modern Palo and Orbetello.

AURELIUS, MARCUS, see MARCUS AURELIUS.

AUREOLE, in sacred art, the luminous cloud surrounding the person of Christ, the Virgin Mary, and saints and martyrs. A circle of light around the head only is properly termed a 'nimbus,' and a combination of the two is known as a 'glory.'

AURICH (53° 29' N., 7° 20' E.), town, Hanover. Pop. 6000.

AURICLE, the external ear; also, from a resemblance in shape, the upper and posterior chambers of the heart.

AURICULA (*Primula auricula*), hardy perennial, originally Alpine herb; well-known spring garden flower with numerous varieties.

AURICULAR CONFESSION, see CONFESSION.

AURIFABER, JOANNES, GOLDSCHMIDT (1519-75), Ger. reformer; studied at Wittenberg, became secretary of Luther, and was present at his death; he edit. Luther's *Letters* (1556-65) and *Table Talk* (1566).

AURIGA (charioteer), constellation of N. hemisphere, between *Taurus* and *Perseus*.

AURILLAC (44° 56' N., 2° 25' E.), town, Cantal, France. Pop. 14,000.

AURISPA, GIOVANNI (1370-1459), Sicilian scholar; spent most of his life in Italy, where he did much to promote the study of Greek, for which he is chiefly remembered; produced some translations of Hierocles and Dio Cassius.

AUROCHS (*Bos taurus primigenius*), recently extinct European wild ox (*Urus* of Cæsar), from which many modern cattle breeds are descended. The bison preserved in Lithuanian and Caucasian forests is closely allied.

AURORA (classical myth.), Roman name of the dawn-goddess (Greek, Eos), dau. of Hyperion and Thea; usually spoken of by the ancient poets as 'rosy-fingered.'

AURORA.—(1) (41° 47' N., 88° 25' W.) town, Illinois, U.S.A. Pop. (1910) 29,807. (2) (36° 58' N., 93° 35' W.) town, Missouri, U.S.A. Pop. 6200.

AURORA BOREALIS AND **AUSTRALIS**, **POLAR LIGHTS**, meteorological phenomenon occurring in high latitudes, chiefly observed in the direction of the magnetic meridian in the northern hemisphere (*Aurora Borealis*), as there is little inhabited land in high latitudes in the southern hemisphere, where it is termed *Aurora Australis*. It takes the form of arcs, bands, rays, wavy curtains, patches, or a 'corona' varying in colour from silvery white to yellow, green, violet, or red, which move about coruscating or resembling illuminated clouds. Curves connecting points of equal annual frequency are termed *isochasms*, the maximum being an oval belt round the N. coast of Siberia, N. America, Labrador, and through the Faroe Islands and N. Norway. Both annual variations in the occurrence have been observed, with a maximum in midwinter and a minimum in midsummer, and

diurnal variations with a maximum in the evening. Numerous explanations of the phenomenon have been brought forward, most investigators agreeing that it represents some form of electrical discharge. There is an intimate relation between aurora and magnetic disturbances, another remarkable connection existing between the frequency of auroral displays and sunspots. A swishing sound is alleged to accompany a. when low above the ground. The phenomenon can be artificially produced by discharging electricity of high potential from a number of metallic points. See **ELECTRICITY**, **MAGNETISM**.

See reports of polar expeditions, and Cleveland Abbe, *Terrestrial Magnetism*, vol. iii., 1898.

AUSCULTATION, listening to the sounds perceptible in the human body, in order to judge the condition of certain organs, especially the heart and lungs. The *stethoscope*, invented by the French physician Laënnec (1781-1826), is the instrument used for this purpose.

AUSGLEICH (Ger. 'adjustment'), especially applied to treaties arranging dual government of Austria and Hungary.

AUSONIA, Vergilian name for Italy, after Auson, s. of Ulysses.

AUSONIUS, **DECIMUS MAGNUS** (310-395), Rom. poet, rhetorician; his extant works include *Gratiarum Actio*, an address to Gratian; *Periocha*, being summaries of the *Iliad* and *Odyssey*; trans. from the *Greek Anthology*, and other works of a scholarly kind.

AUSPICES (Lat. from *avis*, bird; *specere*, to behold), omens which Romans saw in flights of birds.

AUSSIG (50° 42' N., 13° 54' E.), town, Austria; chemicals, glass. Pop. (1910) 39,300.

AUSTEN, **JANE** (1775-1817), Eng. novelist; dau. of Rev. George A.; b. at Steventon Rectory (Hants). Her life was uneventful, and was passed entirely in the county of her birth, at Bath, Southampton, and Winchester, where she died. Of her six novels, *Sense and Sensibility* (1811), *Pride and Prejudice* (1813), *Mansfield Park* (1814), and *Emma* (1816) were all published anonymously, while *Northanger Abbey* and *Persuasion* were published in the year following her death. She experienced great difficulty in finding publishers for her earlier books, and it was not until comparatively recent years that her genius has been fully appreciated, though Macaulay, Scott, Coleridge, Tennyson, and many other people of eminence were her enthusiastic admirers. Her characters are of quite ordinary type, and, apart from her remarkable gifts of humour and satire, her strength chiefly lies in her admirable delineation of female character, in which domain she is unsurpassed. With Scott she purified and ennobled the novel as a form of literature.

Mitton, *Jane Austen and her Times* (1907); monographs by Austen Leigh, Hill, Goldwin Smith.

AUSTER, Roman name for S. wind; hence used in Austria, Australia, etc., to mean south.

AUSTERLITZ (49° 10' N., 16° 52' E.), town, Austria, near which, on Dec. 2, 1805, Napoleon, with a much smaller force, defeated the Austrians and Russians; casualties of allies about 30,000, while Fr. losses only about 7000. Town has palace, church. Pop. 3000 to 4000.

AUSTIN.—(1) (30° 19' N., 97° 43' W.) capital, Texas, U.S.A.; trading centre; lime, cotton-seed oil, fruits, lumber, leather articles; exports grain, cattle, wool. State Capitol, granite, built 1881-88; university. Pop. (1910) 29,860. (2) (43° 39' N., 92° 58' W.) town, Minnesota, U.S.A. Pop. (1910) 6960.

AUSTIN, **ALFRED** (1835-1913), Eng. Post-Laurate (1896); b. Headingley (Yorks); ed. for the Bar, but devoted himself to journalism, and became leader-writer for the *Standard*; made his first appearance as a poet with *The Season: a Satire* (1861), and since that date has issued many volumes of drama, narrative, and lyric verse. His most enduring work is to be

found in such volumes of fanciful prose as *The Garden that I Love* (1894), *In Veronica's Garden* (1895), and *Lamia's Winter Quarters*.

AUSTIN, JOHN (1790–1859), Eng. jurist; s. of an Ipswich miller; m. Sarah Austin (*q.v.*); spent some time in the army, in Sicily and Malta, but subsequently retired, studied law, and was called to the Bar (1818). He was prof. of Jurisprudence in London Univ. (1826–32), where J. S. Mill was one of his pupils. His publications include *The Province of Jurisprudence determined* (1832), and *Lectures on Jurisprudence*.

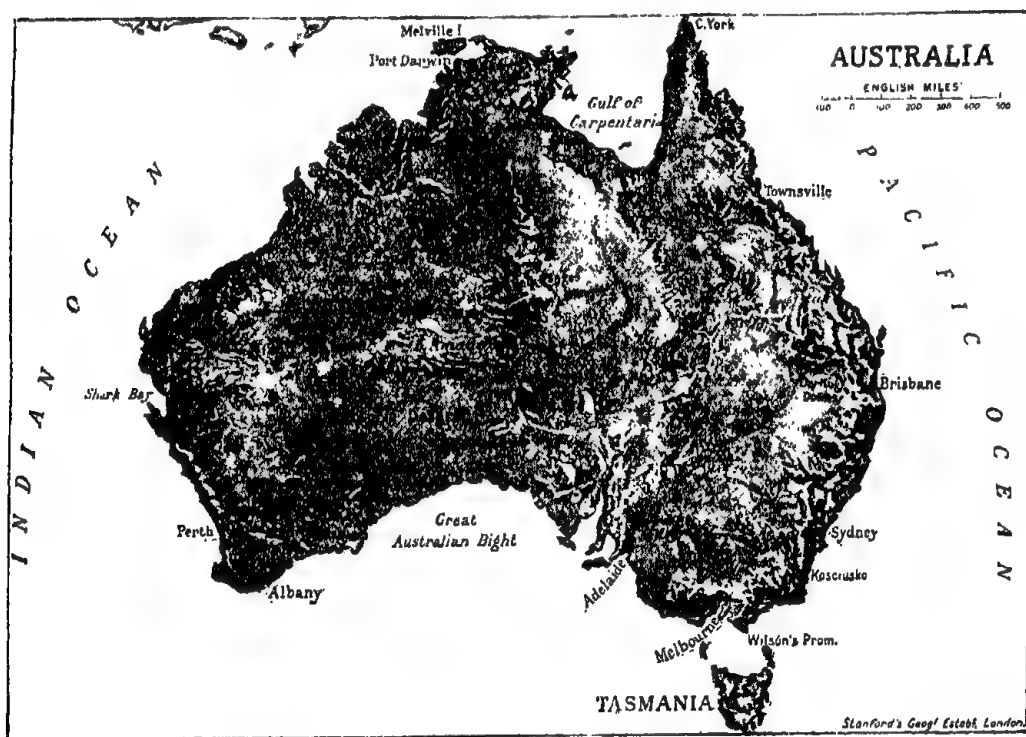
AUSTIN, SARAH (1793–1867), Eng. author; wife of John A. (*q.v.*); trans. into Eng. Ranke's *History of the Popes* (1840), and other hist. works; edit. *Memoirs of Sydney Smith*, Lady Duff-Gordon's *Letters from Egypt*, and her husband's *Lectures on Jurisprudence*.

AUSTIN, STEPHEN FULLER (1793–1836), Texan pioneer; Sec. of State to republic of Texas.

AUSTRALASIA, part of Oceania, comprising

Sandy and Victoria Deserts further W. Lakes are Eyre, Torrens, Gairdner, Amadeus, Frome, all salt lakes, in S. Australia and Northern Territory; Austin, Barlea, Cow-cowing, in Western Australia. Principal rivers are Victoria and Roper, in Northern Territory; Flinders, Burdekin, Fitzroy, and Brisbane in Queensland; Hunter, in New South Wales; Murchison and Swan, in Western Australia; S.E. drained by Murray-Murrumbidgee system, which, with tributaries Darling and Lachlan, drains Great Lowland Plain, entering sea on S. coast.

Climate generally is warm and dry; mean temperature of coldest month, July, varies from 64° to 80° Fahr. in inter-tropical districts, 40° to 64° in parts outside tropics. Rain in some parts torrential; often there are long droughts, disastrous to stock. For climate and production, Dividing Range is important, as it lies directly in path of S.E. trades, and therefore drains moisture from rain-bearing clouds carried



Australia, New Zealand, and adjacent isles; according to some, also includes New Guinea.

AUSTRALIA (10° 39' to 39° 11' S., 113° 5' to 153° 16' E.), continent, southern hemisphere; bounded N. by Torres Strait, E. by South Pacific, S.W. and N.W. by Indian Ocean; separated from Tasmania by Bass Strait. Coast-line little indented; surface divided into narrow coastal strip, broken circle of hills, and central plateau; tableland low; mountains most marked in E., where they extend from Cape York to Melbourne in Great Dividing Range, known in different places as Gregory, Craig, New England, and Liverpool Ranges, Blue Mountains, Australian Alps, and Grampians; highest peak, Mt. Townsend, Australian Alps; across centre of continent are Coast, Macdonnell, and Flinders Ranges; in S.W. is Darling Range. There are no active volcanoes; there are tablelands on either side of Great Dividing Range, that on W. sloping to great central Upland Plains, which pass into Great

against land, with result that E. coast strip receives too much rain, central and W. districts too little. Rainfall is heaviest in N.

A. has unique fauna, having great number of marsupial animals, among which kangaroos, wombats, and opossums may be mentioned as typical Australian mammals. Many parrots occur, and emus, lyre-birds, and black swans are found.

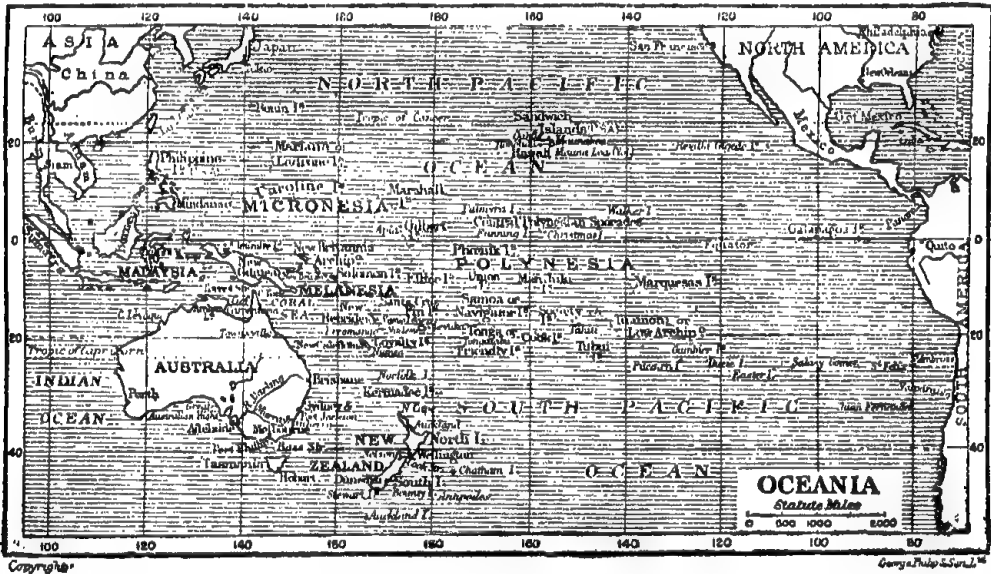
Geology.—Chiefly composed of Archaean rocks; granite forms basis of tableland; volcanic rocks occur in eastern mountainous districts.

Resources.—Vegetable productions may be divided into (1) tropical and sub-tropical forest and crops, in N. and part of E. Queensland coast; (2) forests and crops of temperate zone, in E. coast and in S.E. corner; (3) mountain forests of temperate zone, along Dividing Range; (4) evergreen bushes, in S.W. corner of Western Australia and both sides of Spencer Gulf; (5) pasture and scrub, on rest of country

except deserts. There are many valuable trees—eucalyptus, blue gum, red gum, iron bark, stringy bark, acacia, cabbage palm, karri, jarrah, kangaroo grass, and saltbush. Pasture is great source of wealth; sheep and cattle largely raised. A. is greatest wool-producing country in world, annual output over 800,000,000 lb.; Australian merino wool is longer in staple and heavier than any other; 65 % goes to United Kingdom, 14 % to France, and 9 % each to Germany and Belgium. Cattle-rearing has greatly developed recently, through spread of frozen meat trade; there are about 2,000,000 horses in country and 1,500,000 pigs. Rabbits (introduced from Britain) have become a pest. Chief crops are wheat, hay, potatoes, maize, oats, barley. Grapes, bananas, and other fruits, sugar-cane, cotton, and tobacco are grown; wine industry is rapidly growing. Minerals include gold, silver, copper, tin, coal, iron, manganese, antimony, cinnabar, rubies, sapphires. A. is third gold- and silver-producing country. Coal is little developed.

Trade.—Country's natural resources have brought its commerce to largest figure, in proportion to population, in world; 60 % of trade carried on with United Kingdom, 12 % with other Brit. colonies, and

coasts. Captain Cook explored E. coast in 1770; expedition remained several days in Botany Bay to allow collection of botanical specimens to be made by Sir Joseph Banks and Dr. Solander, who gave name to bay. Flinders, after whom river and mountains of that name are called, surveyed in 1801 part of E. and N. coasts. Grant and Murray explored coast of Victoria about same time, and in 1837-43 the *Beagle*, with Charles Darwin on board, completed coast exploration. Exploration of interior began in XIX. cent. with crossing of Blue Mountains by Blaxland, Lawson, and Wentworth, in 1813; three or four years later Oxley explored Lachlan River, afterwards discovering the Macquarie. Captain King carried out explorations in Western A. in 1821. Darling River explored by Sturt, 1828, who also explored Murrumbidgee in 1831. Sir Thomas Mitchell also explored Darling district, 1833, and surveyed richest part of Victoria. Interior was explored by Eyre, 1840-41, and Sturt, 1845. Part of Queensland was explored by Leichhardt, 1843-46, who crossed thither from Arnhem Land, 1844. One of most successful explorers was Stuart, who made passage across whole continent from S. to N. in 1862, after two unsuccessful efforts on his part and



28 % with other countries. Principal exports are wool, wheat, butter, beef and mutton, skins and hides, copper and gold; chief imports, metal manufactures, cotton and linen goods, iron and steel, apparel, machinery. A. has a protective tariff.

A. has regular communication with all countries. There are cables connecting it with Java, and so with London, and with New Zealand, Norfolk Island, Fiji, Fanning Island, and Vancouver. Railway mileage is over 17,000; lines run from Adelaide to Brisbane, and towards Port Darwin; from Brisbane, Rockhampton, and Townsville into interior; and from Perth to Geraldton and Albany. Trans-continental railway is being constructed from Port Augusta (S. Australia) to link up at Kalgoorlie with West Australian line. Trans-Australian railway from N. to S. is also under consideration. Railways belong to States; postal communications are controlled by Commonwealth; wireless stations round coast.

History.—Date of first discovery of A. is doubtful. A Span. explorer, Torres, sailed through strait now called after him in 1606; later in same cent. Tasman discovered and gave name to Tasmania; Dutch navigators explored part of western coast and islands; and Dampier explored part of W. and N.W.

disastrous expedition undertaken by Wills and Burke in 1861. Other crossings have been made by Warburton, Giles, Forrest, and others.

A. consists of five mainland States, New South Wales, Victoria, Queensland, South A., Western A.; Northern Territory (federal possession); and State and island of Tasmania. Of these, New South Wales is oldest, a Brit. colony and penal settlement having been established here in 1788. Tasmania became separate government in 1825. Population increased between 1850 and 1861 from about 400,000 to nearly three times that number, owing to discovery of gold in New South Wales and Victoria. In 1851 Victoria was constituted a separate State; New South Wales and Victoria obtained right of responsible government in 1855, South A. and Tasmania in 1856. Queensland was detached from New South Wales in 1859, when it was established as a separate colony. Western A. did not receive right of responsible government till 1890, when its population had greatly increased owing to discovery of gold.

The Commonwealth.—In 1901 the States were all united in a federation called the Commonwealth of Australia; Northern Territory and Papua in New Guinea (q.v.) are under the Federal Government.

Gov.-Gen. represents king, first Governor being Lord Hopetoun, subsequently cr. Lord Linlithgow. Legislature consists of Senate and House of Representatives. Senate has 36 members (6 for each original State); House of Representatives has over 72 members, who are elected every three years by universal suffrage, States being represented in proportion to population. Commonwealth Government controls trade, finance, defence, and other national concerns; purely State affairs, including education, controlled by State Parliaments. A site for the Federal capital has been chosen at Yass Canberra (q.v.). Flag is dark blue ground with Union Jack crosses in upper corner, underneath that a six-pointed star, and on outer part five stars arranged like Southern Cross. There is no State religion in A. Education is compulsory in all States; besides State schools there are grammar and high schools, and technical colleges. There are univ's at Sydney, Melbourne, Adelaide, Hobart, Brisbane, and Perth. See UNIVERSITIES.

Defence.—A. is building up a Royal Australian Navy to form a unit of the Royal Navy. It consists (1913) of one armoured cruiser, three unarmoured cruisers, six destroyers, three submarines, and a training-ship. It will be under Australian control in peace, but Imperial control in war. Since 1911 military training is compulsory for males between the ages of 12-26; cadets, 12-18; recruits, 18-20; citizen soldiers, 20-26. Total number under arms (1912), over 89,000.

People are mainly British. Aborigines, numbering c. 170,000, constitute distinct race, and are sometimes regarded as lowest human family. Natives of Tasmania were Papuans, and possibly original inhabitants of A. were also of this race, and were overwhelmed by Dravidian emigrations. Height of typical Australian aborigine is little less than that of average European; he has thick skull, long, narrow head, and receding forehead; colour varies from light to very dark brown; hair black, long, and wavy. Tattooing is common; clothes often absent, sometimes skins are worn. Natives live on grubs, roots, berries, and products of chase. Weapons are primitive but effective, boomerang being a typical weapon. Women are the property of their husbands, and polygamy is practised. Wives are supposed to supply their husbands with vegetables, roots, etc., and are beaten and bruised when enough is not forthcoming. Religion is little more than fear of demons, and there are certain rites practised at different times in a man's life. Language is circumscribed but expressive; sibilants seldom occur, gutturals commoner; there are many inflexions; genders are not distinguished, and they recognise three numbers—singular, dual, plural. Government of tribes is that of family, older men forming council to arrange general affairs. Only domestic animal is dog. Pop. (1911) 4,805,000.

Rusden, *History of Australia* (1897); Thomas, *Native Tribes of Australia* (1907); Barton, *Australian Physiology* (Brisbane, 1895).

AUSTRASIA (Kingdom of East), name of part of old Frankish dominions, subsequently merged in Germany.

AUSTRIA (42° to 51° N., 10° to 26° E.), country, Europe, western part of Austro-Hungarian empire; divided into provinces of Lower A., Upper A., Salzburg, Styria, Carinthia, Carniola, Trieste, Görz-Gradisca, Istria, Tirol, Vorarlberg, Bohemia, Moravia, Silesia, Galicia, Bukovina, Dalmatia; bounded N. by Germany and Russia, E. by Russia and Hungary, S. by Hungary, Adriatic, Italy; W. by Switzerland, Germany; area, 115,903 sq. miles. Surface is mountainous; S.W. occupied by Carnic, Julian, and Dinario Alps (highest point, Ortler Spitz, 12,814 ft.); N.E. by Carpathians; in N.W. are Riesengebirge, Erzgebirge, Böhmerwald, and Moravian Mountains; flat parts are Lower A., round Vienna, and N.E. Galicia; drained by Danube and Drave, flowing to Black Sea; Vistula, to Baltic; Elbe, to North Sea; Adige, to Adriatic. There are

small lakes in S.W.; mineral springs in N.W. Great variety of climate, from perpetual snow of mountains to mild winters in S.; eastern portion has warm summers and cold winters; mean temperature varies from 44° Fahr. in N.E. to 58° in S.W.; mean annual temperature at Vienna, 49°; rainfall varies from 18 in. at Prague to over 60 in. on Adriatic coast. Animals found include wild boar, chamois, bear, wolf, jackal, deer; golden eagles, and herons.

Resources.—Much of surface is covered with forests; in Bohemia and Moravia, pine, beech, larch; in Galicia, oak, beech, elm. A. produces wheat, oats, rye, beet, hemp, rape, flax, hops, tobacco; horses, cattle, pigs, and sheep are raised; silkworms and bees are kept. Minerals include coal, lignite, graphite, salt, zinc, silver, iron, lead, quicksilver, copper. Industries include sugar-making, manufacture of woollen, linen, silk, and cotton textiles, iron and steel, glass, beer. More than half population is engaged in agricultural pursuits; dairy-farming important in Alpine districts; exports timber, coal, sugar, horses, cereals, dairy produce, glass, etc.; imports wool, cotton, silk, cattle, leather, rice, etc. Country is well supplied with railways, Vienna being one of greatest railway centres in Europe. Most important waterways are Danube and tributaries.

Inhabitants include Germans, Czechs, and Poles, Magyars, Italians, Slovenes, Jews, and other races. Pop. (1910) 28,570,000. State religion is Roman Catholicism. Education is controlled by State. For Literature, see GERMANY: *Literature*. Government is limited monarchy, with imperial title. Parliament, or *Reichsrath*, consists of two houses. See AUSTRIA-HUNGARY.

AUSTRIA, LOWER (48° N., 15° E.), crownland, Austria, forming E. portion of archduchy of A.; hilly; crossed by Danube; sends 64 representatives to Reichsrath; area, 7654 sq. miles. Pop. (1910) 3,532,000.

AUSTRIA, UPPER (48° 45' N., 16° E.), crownland, Austria, forming W. portion of archduchy; crossed by Danube; sends 22 members to Reichsrath; area, 4631 sq. miles. Pop. (1910) 853,000.

AUSTRIA-HUNGARY (42° to 51° N., 9° to 27° E.), empire, Central Europe; territories include *Cisleithan* dominions, viz. Empire of Austria (q.v.), *Transleithan* dominions, viz. Kingdom of Hungary (q.v.), and Provinces of Bosnia (q.v.) and Herzegovina. A.-H. is bounded N. by Germany and Russia, E. by Russia and Rumania, S. by Rumania, Servia, Montenegro; W. by Germany, Switzerland, Italy; area, c. 260,000 sq. miles; second largest empire in Europe. Pop. (1910) c. 51,340,000.

History.—Country was apparently occupied in prehistoric times by Celtic tribes, of whom Taurisci have been identified with later Norici who came into conflict with Rome in I. cent. B.C. Other inhabitants were Germanic tribes, who had migrated hither from farther N.; among these, Cimbri and Teutons were defeated by Marius in 101 B.C. Subsequent Rom. campaigns were those of Julius Caesar against Marcomanni, of Octavianus in Pannonia and Dalmatia, and of Drusus and Tiberius in Tirol and Eastern Alps.

During decay of Rom. empire, country was successively occupied by various barbarian tribes; Goths and Franks appeared in III. cent., Huns in IV.; Avars established themselves here in VI. cent., holding their own for about 250 years, till close of VIII. cent., when they were subdued by Franks under Charlemagne, who founded Margravate of A. and sent Frankish colonists there. A century later, Hungary was invaded by Magyars, who put an end to influence of Franks; and were in turn defeated by Ger. king Otto I., who re-established Margravate, which late in X. cent. was granted by Otto II. to Leopold, count of Babenberg. Babenberg family governed A. till 1246, when became extinct with death of Duke Frederick, slain in battle with Magyars. Emperors meanwhile belonged to Saxon, Franconian, and Hohenstaufen families. On Duke Frederick's death, disputes arose as to succe-

sion to his dominions A. and Styria, which were finally sequestered by Emperor Frederick II. and transferred to Otto of Werdenberg; subsequently taken by Otto of Bavaria, and then by Ottokar of Bohemia, who also acquired Carinthia and Carniola (c. 1268), but later lost all his dominions to RUDOLPH OF HAPSBURG, who was elected Ger. king in 1273.

Rudolph had them made hereditary in Hapsburg family, and they were conferred on his sons, Albrecht and Rudolph, at Diet of Augsburg, 1282. A. and Styria were then governed by Albrecht and his descendants; Carinthia, which was granted to Meinhard of Tirol in 1286, reverted to Hapsburgs in 1335, while Tirol, Istria, and other territories were also added to Hapsburg dominions at various dates.

XIV. century.—After death of RUDOLPH IV. in 1365, his bro., ALBRECHT III., took over A. and Carniola. LEOPOLD III., another bro., took Styria and other territories,

brand, who had been elected king of H. on death of Matthias Corvinus. MAXIMILIAN succeeded his f. in 1493; he had already acquired Netherlands by marriage with Mary of Burgundy, and been elected Rom. king in Frederick's lifetime; reign marked by reforms in empire and advance of Hapsburgs (q.v.).

Reformation (q.v.) began in this reign and continued in that of Maximilian's grandson, CHARLES V., who succeeded him in 1519 as archduke of A. and as emperor. He aimed at establishing Roman Catholicism; and was the most powerful ruler in Europe, holding also Spain and Netherlands. The Austrian territories he handed to his bro., FERDINAND I., while Spain and Netherlands passed to his s., Philip II. of Spain. Ferdinand I. was m. to Anne, dau. of Ladislaus of Bohemia and H., in whose right he had succeeded to Bohemian throne in 1526; but his claim to H. was disputed, and he obtained only royal title and part of



PHILIP A. SON LTD

but in war against Swiss was slain at *Sempach*, 1386, whereupon Albrecht III. temporarily administered his dominions, presently transferring them to his nephews, Leopold's sons; family continuing to hold Styria, while elder branch had A. ALBRECHT V. of A. added Bohemia and Hungary to his dominions by marriage with Elizabeth, dau. of Emperor Sigismund, king of these countries, 1437; became Ger. king, 1438; imperial crown henceforward held by Hapsburgs till 1740. At death of Albrecht's (posthumous) s., Ladislaus, in 1457, A. passed to surviving Hapsburg princes, and ultimately to Emperor **FREDERICK III.**; but Bohemia and Hungary elected as their kings George Podebrand and **MATTHIAS CORVINUS** respectively; latter invaded A., 1477, and took Vienna, which Maximilian, s. of Frederick III., afterwards recovered. Austrian territories were restored to Frederick III. by Treaty of Pressburg, 1491, when also succession to Bohemia and H. was entailed on Hapsburgs, on extinction of male descendants of Ladislaus, s. of Pode-

brand, who had been elected king of H. on death of Matthias Corvinus. MAXIMILIAN succeeded his f. in 1493; he had already acquired Netherlands by marriage with Mary of Burgundy, and been elected Rom. king in Frederick's lifetime; reign marked by reforms in empire and advance of Hapsburgs (q.v.).

A.-H. in XVI. century.—Maximilian II. was succeeded by his s., RUDOLPH II., in 1576, who tried to put down Protestantism, which led to open revolts in various parts of his dominions; in his reign Turks under Sultans Amurath and Muhammed invaded H., supporting rebels there and practically establishing independence; Rudolph, who concerned himself less with political affairs than with study of alchemy and astrology, was in 1608 compelled to cede A., H., and Moravia to his bro. MATTHIAS, to whom crown of Bohemia was also transferred in 1611. Matthias made concessions to his Prot. subjects, and re-established authority in A., 1609.

At Rudolph's death in 1612, Matthias obtained imperial crown. Being childless, he succeeded in entail-

ing his dominions on his cousin, Ferdinand of Styria, who became emperor (FERDINAND II.) at Matthias's death, 1619. Protestants in Bohemia and H., however, rejected him, Bohemia choosing Frederick, Elector Palatine, as king, whereupon THIRTY YEARS WAR (*q.v.*) broke out; after battle of *White Mountain*, 1620, elector fled and Ferdinand was reinstated in Bohemia. War later assumed European character, cause of Protestants being aided by France and Denmark; Ferdinand, for whom Wallenstein raised large army, was predominant in his dominions by 1629; extirpated Protestantism, issued Edict of Restitution, restoring Catholics to Church offices. He was now opposed by Gustavus Adolphus (*q.v.*) of Sweden, who was subsequently joined by John George of Saxony; combined army defeated imperial troops at *Breitenfeld*, 1631, and at *Lützen*, 1632. In 1634 Emperor's s. Ferdinand defeated Swedes at *Nordlingen*; he succeeded his f. as FERDINAND III. in 1637. War continued for many years, becoming struggle of France and Sweden against A. and Spain; ended by Peace of Westphalia, 1648, whereby Calvinism was recognised and advantages secured to Protestants.

Ferdinand III. was succeeded in 1657 by his s., LEOPOLD I., who warred against Turks, from whom he gained Transylvania, most of H., part of Slavonia, and Croatia by Treaty of Carlowitz, 1699; persecuted Hungarian Protestants.

The XVIII. century.—Leopold died in 1705, before close of WAR OF SPANISH SUCCESSION (*q.v.*); his son and successor, JOSEPH I., made treaty of neutrality for Italy with Louis XIV.; his principal work was pacification of H.; d. 1711, succ. by bro., CHARLES VI., whose chance of succession in Spain ended with Peace of Utrecht, 1713. He joined Quadruple Alliance; exchanged Sardinia for Sicily; became involved in war with Turks on behalf of Venice, which resulted in addition of part of Bosnia and Servia to Austrian dominions; issued Pragmatic Sanction (*q.v.*), 1720, with object of securing succession of his dau., Maria Theresa; warred against France, 1733–35, on question of Polish succession; towards end of reign, again involved in war with Turkey, to whom he lost Servia; d. 1740.

On death of Charles, 1740, Spain, Saxony, and Sardinia sought to dismember Empire, while Charles, Elector of Bavaria, claimed (*inter alios*) to be heir to whole, and the WAR OF AUSTRIAN SUCCESSION began. MARIA THERESA, though gifted and patriotic, was young and inexperienced. Prussia, which had guaranteed Pragmatic Sanction, led attack by occupying Silesia; Austrian general, Neipperg, was defeated at *Mollwitz*, 1741. France, also guarantor of Pragmatic Sanction, now made treaty with Prussia for partition of empire and appointment of Elector of Bavaria as emperor with diminished realm; Linz was captured and Elector became Charles VII.; Maria, however, made touching appeal to loyalty of her Hungarian subjects, and bought off Frederick the Great by secret cession of Silesia, Oct. 1741; he repudiated the treaty, but ceased to prosecute war with vigour. On death of Charles VII., 1745, Maria Theresa's husband was elected emperor as FRANCIS I.; war ended with Peace of Aix-la-Chapelle, whereby Maria Theresa was recognised as queen of A., but had to confirm Frederick of Prussia's acquisition of Silesia, and cede her Ital. duchies to Philip of Spain, Savoy and Nice to Sardinia. Her subsequent attempt to recover Silesia resulted in SEVEN YEARS WAR (*q.v.*), 1756–63, which, ending with Peace of Hubertsberg, left position unchanged. She henceforth devoted herself to internal affairs, reforming government, education, Church, and improving commercial and industrial conditions.

Francis I. d. in 1765, and their s. became emperor as JOSEPH II., and joint-ruler of A. with his mother. Maria Theresa acquired Galicia and Lodomeria by partition of Poland, 1772; she d. in 1780. Joseph tried to unify his dominions by doing away with distinctions of language, etc.; he did much to ameliorate condition of lower classes; declared Roman Catholicism

to be State religion, but tolerated other religions; his reforms induced revolts in Tirol and Netherlands; he was unsuccessful in war against Turks; d. 1790. His bro. and successor, LEOPOLD II., put down revolt in Netherlands, and made peace with Turks and Prussia, who had allied themselves against A. On outbreak of Fr. Revolution he formed alliance with Frederick William of Prussia, 1792, but died soon afterwards. His s., FRANCIS II., succeeded him; he warred against France, and was party to second division of Poland, 1793; defeated by Napoleon Bonaparte, 1796; acquired Venice, but lost Austrian Netherlands by Treaty of Campo-Formio, 1797; subsequently lost much to France; proclaimed hereditary emperor of A. as FRANCIS I., 1804; two years later resigned crown and government of Holy Rom. Empire.

The XIX. century.—By Treaty of Pressburg, 1805–6, he lost Venice to Italy, Vorarlberg, Tirol, etc., to Bavaria; by Peace of Schönbrunn lost further territories (Galicia, Salzburg, part of Bohemia, Croatia, etc.) to France, Russia, Saxony, and Rhine Confederation, 1809. Metternich now became chief minister; formally declared war against France, 1813, whereupon alliance formed between A., Prussia, Russia, and United Kingdom, with ultimate result of Napoleon's defeat and abdication in 1814. By Congress of Vienna, A. then regained her possessions in N. Italy, acquired Lombardy and precedence in new federal diet of Germany.

Francis I. died 1835; reign of s., FERDINAND I. (1835–48), marked by risings; national movement commenced in H. (inspired by Szechenyi, Kossuth, Deák), and in Croatia and Bohemia; revolution in Cracovia led to its annexation, 1846; Fr. Revolution, 1848, caused fall of Metternich from power, and forced emperor to grant power to diet to establish constitutional government, freedom of speech, press, etc. Czechs were fully enfranchised. Meanwhile, Lombard insurrection commenced at Milan, and every Austrian State armed itself to win independence; emperor fled and abdicated, Dec. 1848, in favour of nephew, present emperor, Francis Joseph; revolutions quelled, 1849; emperor hastened to forestall action of diet, by himself promulgating constitution, suppressed 1852; retrogressive and repressive policy; War of Italian Independence broke out, 1859; Lombardy lost, and Austrian rulers of Modena, Parma, and Tuscany expelled, 1859; constitution again granted, 1860–61, but bitterly opposed by non-German provinces. Decisive defeat by Prussia at *Königgrätz* led to Treaty of Prague, 1866, by which Austria lost Venice and her status in Germany; continued revolts in H. led emperor to grant it autonomy, 1867, by celebrated compromise; dualist system of Austro-Hungarian monarchy led to great discontent, particularly of Slavs, and A. has still to consider ad visability, or even necessity, of turning her empire into federation.

Reichsrath was made independent of provincial diets by Liberal centralist ministry, 1873, which strengthened Ger. minority and introduced religious and legal reforms, but was involved in financial scandals of 1873. A. strengthened her position by alliance with Germany, 1879; invited by Berlin Congress, she occupied Bosnia (*q.v.*) and Herzegovina, 1879, and, supported by Germany and disregarding the expostulation of the Powers, annexed them, 1908. The ministry of Taaffe (1879–83) favoured federalism and, at same time, autocracy. Czechs, conciliated, sent deputies to *Reichsrath*; their language was made official speech in Bohemia and Czech Univ. founded at Prague, despite opposition of Germans; alliance with Italy, 1882, freed A. from fear of aggressive party of *Italia irredenta*, which sought the union of Italian-speaking districts with Italy; foreign ambitions of A. since *Sedan* directed to east, but energies absorbed in keeping together heterogeneous empire. Elements of opposition in interior combined to win electoral reform, 1896, which merely enraged socialists and nationalists by its insufficiency. H. meanwhile had been faced with similar problems; she granted to Croatia

its own language as official tongue and fair representation in Hungarian Parliament, 1868, and strove to keep balance even between ruling Magyar and subject-peoples of H. till retirement of Deák (d. 1876). His successor Tisza sought to make H. balance A., and to establish Magyar supremacy in H., thus winning hatred of Croats and his own fall, 1890; after his fall reforms went forward; religious toleration secured. Tisza had made H. chief member of dualist system and established party which has since worked for replacement of dualist system by merely personal tie, but nationalism now seems stronger influence; Germanising ended in A. with introduction of universal suffrage, 1907, as Magyarising is expected to do when promised measure is passed in H.

Government.—The empire of A. and kingdom of H. were united, 1868, under emperor-king as the Austro-Hungarian monarchy; hereditary dual monarchy, descending in tail male with remainders to female issue according to Pragmatic Sanction, 1713; dual foreign policy, army, navy, treasury, railway services, etc.; separate governments with common executive. Austrian Parliament, *Reichsrath*, is composed of upper chamber of nobles, bp's, and nominees of emperor, and lower chamber of elected representatives of seventeen provinces of A.; Hungarian Parliament has House of Magnates (*Magnatentafel*) and House of Representatives (*Repräsentantenrat*); Central Board, *Delegation*, elected by the two Parliaments, meets in Vienna and Buda-Pesth alternately; provincial diets (except in Transylvania, which is administered from Hungary) and communal councils regulate local affairs.

Defence.—The common army is recruited by compulsory service of males between ages of 19–42. In addition, there are the separate Austrian and Hungarian Landwehr and Landsturm forces and the Ersatz reserve. Peace establishment is 312,540, including 22,540 officers and officials. Reorganisation, now in progress, is to be completed 1915.

Navy consists of 13 battleships, 3 armoured cruisers, 8 small cruisers, 6 torpedo vessels, 12 destroyers, 55 torpedo boats, 6 submarines; but additions are rapidly being made in execution of the new naval programme of 1911. Personnel is 1500 officers and 13,500 men.

Coxe, *House of Austria* (continued by Kelly, 1873); Whitman, *Austria* (Story of the Nations, 1899); Colquhoun, *The Whirlpool of Europe* (1907); Hampel, *Ungarische Alterthümer* (1905); Hugessen, *Political Evolution of the Hungarian Nation* (1908); Drage, *Austria-Hungary* (1909).

AUSTROMANCY, divination and prophecy from observation of winds.

AUTEUIL (48° 50' N., 2° 20' E.), division of Paris.

AUTHORISED VERSION, see BIBLE.

AUTO, Span. and Portug. mystery play; Lope de Vega Carpio, Calderon, and others wrote a's; still played in Portugal, but prohibited in Spain, 1765.

AUTOBIOGRAPHY, a man's life written by himself. From beginning of literature men have in some form written a., which fulfils two human needs, gossip and confession; instinct of a. extended to public events produces memoirs, chronicles, and history. A. includes diary kept for private purposes and set account destined to be presented to world, and may be of nature of annals (narrative of events), or account of thoughts and feelings. Early example of latter kind of a. is Hebrew *Psalms*; modern example is *Journal* of Marie Bashkirtseff (q.v.), in which strong thread of passion connects few events of monotonous life; this *Journal* is rare instance of deliberate bequest to the world of private matter for its value as 'a human document'; illustrates special interest in self which has intimate connection with artistic production; late masterpiece in this kind Edmund Gosse's *Father and Son*.

Other books which take form of a. may be mixture of fiction and confession, as in Sterne's *Sentimental Journey*, or purely fictitious like *Don Quixote* or

Gil Blas, where device gives attraction of verisimilitude. Early a's usually simple annals which are invaluable historically; they became common in England in XVII. cent., when, besides famous diaries of Evelyn and Pepys, a's were frequently written by unimportant people like Mrs. Alice Thornton (*Memoirs* [Surtees Soc.]), and throw light on manners and customs. Among XVI. cent. a's chief is that of Benvenuto Cellini (1500–72); important a's of XVII., XVIII. and XIX. cent's are Bunyan, *Grace Abounding*; Wesley, *Journal*; Gibbon, *Memoirs*; Walpole, *Short Notes of my Life*; Rousseau, *Confessions*; Silvio Pellico, *Le mie Prigioni*; Goethe, *Aus meinem Leben*; Coleridge, *Biographia Literaria*; Autobiography of John Stuart Mill; Ruskin, *Proserpina*; Mark Pattison, *Memoirs*.

AUTOCETHONES, natives of the soil, as distinct from settlers; name used by the Greeks.

AUTOCLAVE (*Digester*), apparatus, with safety valve, for heating liquids under pressure.

AUTOCRACY, despotic power vested in a single individual, like that of Russia; government by aristocracy, being government by the privileged few; while democracy stands for government by the many.

AUTO-DA-FÉ ('act of faith'), grim ceremony of the Span. Inquisition in putting to death heretics. The first a. took place in 1481, the last in 1826.

AUTOGAMY, self-fertilisation (bot.).

AUTOGENY, hypothetical inorganic phase in evolution of living matter.

AUTOGRAPHE, document written or signed by a particular individual or a separate signature. A. signatures to documents were common from the earliest times, as may be seen from the papyrus seals and waxen tablets recovered from the ancient Egyptian tombs, and from the ruins of Pompeii and Herculaneum. The employment of a monogram, or sign manual, in place of the full a., became common about the reign of Charlemagne, and continued in use for some considerable time, but eventually gave place to the custom of using seals. Later it became usual to append the signature in addition to the seal. Collections began in XIV. cent. See Nichols, *Autographs of Royal, Noble, Learned, and Remarkable Personages* (Eng.); Hardy, *Handwriting of the Kings and Queens of England*, Facsimiles of A's in the Brit. Museum; Scott and Davey's Guide.

AUTOGRAVURE or photogravure, photographic process by which engraved negative is obtained from which prints can be made; discovery patented by J. R. Sawyer, London, 1884.

AUTOHARP, musical instrument of unequal chords like harp; when certain chords are pressed down rest form chord.

AUTOLYCUS (classical myth.), s. of Hermes; noted as a thief and swindler; hence the derivation of A. in Shakespeare's *Winter's Tale*, who claimed to be 'a picker-up of unconsidered trifles.'

AUTOLYCUS OF PITANE (c. IV. cent. B.C.), Gk. mathematician and astronomer.

AUTOMATISM, involuntary action; the theory that consciousness does not control one's actions. — **Automatic Writing** is performed without their volition by persons in an hypnotic or hysterio-epileptic 'trance.' This phenomenon of subconscious mentality forms a debatable argument for spiritualism.

AUTOMEDON (Gk. myth.), charioteer of Achilles and Neoptolemus.

AUTOMOBILES, see MOTOR-CAR.

AUTOMORPHISM, the practice of automorphic characterisation (i.e.) to form a conception of another's mind on the pattern of one's own.

AUTONOMY (Gk. self-rule), right of bodies politic to control their own affairs. Cherished privilege of Ionian cities and colonies of Greece and of states of mediæval Germany and Italy; term now chiefly employed in describing rights of self-government enjoyed by certain subject states.

AUTOPSY, term originally and correctly applied to a personal examination; now generally to the

examination and dissection of a dead body to ascertain the cause of death.

AUTOTYPE, photographic printing process largely used for reproduction of works of art.

AUTRAN, JOSEPH (1813-77), Fr. poet; wrote *La Mer* (1835); *Vie Rurale* (1856); *Laboureurs*, *Soldats* (1854); also *La Fille d'Échyle*, traged (1848).

AUTUMNAL EQUINOX, see **ARIES**.

AUTUN (46° 58' N., 4° 20' E.), town, Saône-et-Loire, France; bp.'s seat; XII.-cent. cathedral Rom. antiquities; cloth.

AUTUNITE, $\text{CaCO}_3\text{-URANITE}$, $\text{Ca}(\text{VO}_2)_2(\text{PO}_4)_2 + 8$ (or 12) H_2O , mineral found near Autun, in Saxony, and in Cornwall.

AUVERGNE (45° 20' N., 2° 40' E.), ancient province, France; now forming departments Puy-de-Dôme, Cantal, and part of Haute-Loire; united to France, 1610; mountains, volcanic structure; fertile minerals.

AUWERS, ARTHUR (1838-), Ger. astronomer; director of Potsdam new observatory, 1881; author of works on fixed stars and solar parallax, and of Catalogue of the stars.

AUXANOMETER, apparatus for measuring growth in plants.

AUXENTIUS (fl. c. 370), Arian theologian; bp. of Milan, 355-74.

AUXERRE (47° 55' N., 3° 35' E.), town, Yonne, France; formerly bp.'s seat; fine cathedral and churches; ancient walls surrounding city form site for boulevards; wine, ochre.

AUXIMUM (43° 29' N., 13° 30' E.), ancient town, Picenum; Rom. fortress; cathedral.

AUXONNE (47° 10' N., 5° 52' E.), town, Côte d'Or, France; fortified by Vauban.

AVA (21° 54' N., 96° 4' E.), former capital, Burma; now ruined.

AVADĀNA, Buddhist romances, *Century of Legends*, *The Heavenly Legend*, etc.

AVAHĪ (*Avahis kaniger*), lemur living in the forests of Madagascar.

AVALANCHE, collection of snow or ice which descends from higher latitude. Different kinds are: (1) Drift or Dust A., which acquires tremendous velocity, causes compression of air, and becomes dangerous force; (2) Glacial A., which descends from glaciers in summer months.

AVALLON (47° 28' N., 3° 54' E.), town, Yonne, France; wine. Pop. 5900.

AVALON, in the Arthurian legends the place to which King Arthur was borne after his last battle; identified with neighbourhood of Glastonbury and other places.

AVARS (VI. cent.), Tartar tribe; conquered Pannonia and Dalmatia, but were subdued by Charlemagne.

AVATAR, the descent and incarnation of a Hindu deity upon earth; thus regarding the ten *āvatāras* of Vishnu it is held that he has already visited the earth nine times, and that when he finally appears, as the horse Kalki, the earth will be destroyed.

AVATCHA BAY (53° N., 158° 30' E.), bay, Kamohatka, Asia.

AVE MARIA (Lat. 'Hail, Mary!'), first words of prayer used by Roman Catholics, a composite of the words used by angel Gabriel to the Virgin Mary (*Luke* 1²⁸), those used by Elizabeth to her (*Luke* 1⁴²), and an invocation of the Virgin's help.

AVEBURY, **ABURY** (51° 25' N., 1° 51' W.), village, Wiltshire, England; near megalithic antiquities consisting of stone circles, and immense barrow known as Silbury Hill. See **STANDING STONES**.

AVEBURY, JOHN LUBBOCK, 1ST BARON (1834-1913), English banker, politician, and author; s. of Sir J. W. Lubbock, Bart.; sat in parliament for Maidstone and for London University; Vice-Chancellor of latter; author *Ants, Bees, and Wasps* (1882), *Pleasures of Life* (1887), and many other works.

AVEIA (42° 16' N., 13° 15' E.), ancient town. Via Claudia Nova, Italy.

AVEIRO (40° 38' N., 8° 39' W.), seaport and province, Portugal; bp.'s seat; fisheries.

AVELLANEDA, GERTRUDIS GOMEZ DE (1816-73), Span. poetess and novelist, etc. (pseudonym, *Peregrina*).

AVELLINO.—(1) (40° 55' N., 14° 47' E.) town, Italy; seat of bishopric. Pop. (1911) c. 23,873. (2) (41° N., 15° E.) province, Italy. Pop. (1911) 397,048.

AVEMPAGE (d. 1138), Arab. philosopher; lived in Spain; wrote *Conduct of the Solitary*, set of moral maxims for the proper ordering of life. See **ARAB**.

AVENTINE HILL (*Mons Aventinus*), one of seven hills of Rome, included in growing city by Ancus Martius; plebeian quarter in later times.

AVENTURINE, variety of quartz, occurring chiefly in Ural Mts.; also kind of glass with gold-red spangles.

AVENZOAR (XII. cent.), Arab. physician; b. Seville; held in great repute in his day; wrote *The Method of Preparing Medicines and Diet*; trans. into Latin by Paravicinus (Venice, 1490).

AVERAGE, term used to define a service due from a feudal tenant to his superior, which was usually carriage of goods; in modern shipping it refers to loss caused by accidents in navigation, and consequent loss or depreciation of cargo, and is either *general* or *particular*; in general use, a mean proportion or quantity, made out of unequal quantities, obtained by adding the sum of the quantities, and dividing by the number of quantities—thus, A gains £20, B £25, and C £30; the average gain is £25. The term is also used in reference to persons of a general standard, as the 'average man,' the 'average student,' etc. *Average*, *Adjustment of*, term used in Marine and also Fire Insurance to determine the amount the policy-holder is entitled to receive, and the distribution of loss to be borne by the underwriters.

Lowndes, *General Average*, 4th ed., 1838; Hopkins, *Handbook of Average*.

AVERNUS, AVERNO (40° 54' W., 14° 4' E.), small lake, near Naples; crater of extinct volcano. Birds lying over it were said to fall dead, and through it Vergil's Aeneas descended to Hades; Vergil wrote of *facilis descensus Averno*; close by is cave of sibyl of umes.

AVERROES (1126-98), Arab. scholar; lived in Spain and Morocco; studied math's, philosophy, heal., and med.; a profound admirer of Aristotle, he held that both active and passive intellect are one in all men, that religion is but the philosophy of the illiterate, that matter, an emanation from God, is eternal, and that life exists on each of the heavenly bodies. See **ARAB**.

AVERSA (40° 59' N., 14° 11' E.), town, Caserta, Italy; founded by Normans, 1027.

AVES, see **BIRD**.

AVESNES (50° 9' N., 3° 58' E.), town, former fortress, Nord, France; wool-spinning. Pop. 6220.

AVESTA (**ZEND-AVESTA**), sacred books of Parsees; our divisions; sacrificial liturgy, law, forms of worship and prayers; nearly all lost but liturgy.

AVEYRON (44° 18' N., 2° 40' E.), mountainous department, S. France; formed old district Rouergue; chief rivers, the Lot, Aveyron, and Tarn; good pastures, sheep and cattle; celebrated Roquefort cheese; coal, on. Pop. (1911) 369,448.

AVEZZANO (42° 2' N., 13° 28' E.), town, Aquila, Italy; castle (1490).

AVIANUS, Lat. fabulist; Eng. version was printed by Caxton (1483); later edit. by R. Ellis (1887).

AVIARY, an enclosure for keeping birds in captivity ther as a pastime, or for culinary purposes, or in order to study their habits.

AVIATION, see **FLIGHT**.

AVICHEBRON, SALOMON BEN JEHUDA BEN GABRIEL c. 1020-70), Span. -Jewish poet and philosopher,

sometimes called an Arab; wrote in Arabic important scholastic works.

AVICENNA (980-1037), Arab. scholar; ed. Bokhara, then a centre of Muhammadan culture; studied math's and philosophy, specially Aristotle's *Metaphysics*; became vizier; his pleasure-loving life hastened his death. A's philosophy is a Neoplatonic Aristotelianism; he holds that the active intellect is one and universal and that knowledge comes from its contact with the individual passive intellect, that being may be divided into the (1) necessary of itself—God, (2) the necessary by God's decree though but possible of itself, and (3) the merely possible. See **ARABS**.

AVIENUS, RUFUS FESTUS, Roman geographer and poet of IV. cent. A.D. Translated Greek geographical works into hexameters and compiled other geographical works.

AVIGLIANA (45° 4' N., 7° 20' E.), town, Turin, Italy; dynamite.

AVIGNON—*Avenio*, 'Windy City'—(43° 58' N., 4° 49' E.), town, on Rhône, France; founded by Phocéans, 539 B.C.; ancient cathedral and palace; residence of popes (1309-76), to whom city belonged till annexation to France, 1791; mediæval bridge and XIV.-cent. walls; here Petrarch first saw Laura; Villeneuve-les-A. (q.v.) is suburb across Rhône; abp.'s seat; formerly univ.; silk, madder. Pop. (1911) 49,304.

AVILA.—(1) (40° 40' N., 5° W.) province, Spain, S. part Old Castile; area, 3042 sq. miles; mountainous, centre and south; merino wool, timber; lower fertile tracts towards N.; grain. Pop. (1910) 209,000. (2) (40° 38' N., 4° 46' W.) town; St. Teresa's birth-place. Pop. 12,000.

AVILA, GIL GONZALES DE (1577-1658), Span. historiographer; wrote lives of some of the Castilian kings; also descriptions of cathedrals and biographies of prelates.

AVILA, JUAN DE (1500-69), Span. priest and mystical writer; associated with monastic reforms of St. Teresa (q.v.).

AVILA Y ZUNIGA, LUIS DE (c. 1548), Span. historian; much favoured by Charles V.

AVILES (43° 31' N., 5° 56' W.), seaport, Oviedo, Spain; glass. Pop. c. 13,000.

AVILONA, see **AVLONA**.

AVISON, CHARLES (c. 1710-70), Eng. musical composer; wrote *Essay on Musical Expression*, edited Marcello's *Paraphrases of the Psalms*.

AVITUS, MARCUS MECILIUS (d. 456), Rom. emperor of West; prefect of Gaul when chosen emperor on death of Maximus, 455; deposed by Ricimer, 456.

AVIZ, ORDER OF, Portug. religious military order, founded XII. cent., named from its seat, A., with which it was endowed by Alfonso II., 1211-23; reorganised and remains as military order purely.

AVIZANDUM (Lat. *avizare*), Scot. legal term, meaning to consider, in reference to a judgment.

AVLONA, AVILONA, VALONA (40° 29' N., 19° 26' E.), port, European Turkey; seat of Greek abp.; damaged by earthquake, 1831. Pop. c. 6000.

AVOCA, OVOCA (52° 48' N., 6° 9' W.), river and valley, Co. Wicklow, Ireland; celebrated in Moore's poem, *The Meeting of the Waters*.

AVOCADO PEAR (*Persea gratissima*), a luscious W. Indian fruit.

AVOGADRO, AMADEO, CONTE DI QUAREGNA (1776-1856), Ital. physicist; discovered that (*Avogadro's law*) equal volumes of different gases, at same pressure and temperature, contain same number of molecules.

AVOIRDUPOIS, system of weights used in Britain and N. America.

AVOLA (36° 55' N., 15° 6' E.), town, Sicily. Pop. 16,300.

AVON (Celtic, 'river').—(1) East (50° 48' N., 1° 47' W.), rises Wiltshire, enters Eng. Channel, at Christchurch. (2) Lower (51° 25' N., 2° 43' W.), rises

Cotswold Hills, Gloucestershire; flows Bristol Channel. (3) Upper (52° 3' N., 2° 8' W.), rises Naseby, North-

Banffshire. (6) (56° 2' N., 3° 41' W.) tributary of Forth, Scotland.

AVONIAN, Lower Carboniferous formation in Avon gorge, Bristol; corresponds to Dinantien of Fr. geologists; sub-stages are Kidwellian and Clevedonian.

AVONMOUTH (51° 30' N., 2° 41' W.), town, Gloucestershire, England; docks.

AVRANCHES (48° 40' N., 1° 22' W.), town, Manche, France; cider, lace, salt, leather-dressing. Pop. 7500.

AVRE (49° 45' N., 1° 24' E.), river, Somme, France.

AVRICOURT (48° 37' N., 6° 46' E.), town, Franco-German frontier; customs.

AWAJI (34° 34' N., 134° 44' E.), island, Japan, between Hondu and Shikoku; pottery.

AWE, LOCH (56° 20' N., 5° 10' W.), fresh-water loch, Argyllshire, Scotland; ruin, Kilchurn Castle.

AXE, weapon found with earliest human remains in Stone and Bronze Ages; now made of iron, with steel edge and wooden haft.

AXEL, abp. See **ABSAŁON**.

AXENSTRASSE, road hewn out of rock beside Lake Lucerne, between Tell's Chapel and Flüelen.

AXHOLME (53° 32' N., 0° 50' W.), island, N.W. Lincolnshire, formed by rivers Trent, Idle, and Don. Pop. (1911) 6816.

AXILE, AXIAL, related to the axis; embryo maintaining axis of seed (bot.).

AXIM (4° 47' N., 2° 5' W.), town, Gold Coast, Africa.

AXINITE ($\text{HCa}_2\text{Ba}_2(\text{SiO}_4)_4$), clove or violet mineral, wedge-shaped anorthic crystals, found in basic eruptive rocks; occasionally used as gems.

AXINOMANCY, Gk. method of discovering crime by ordeal of axe.

AXIOM, an adage, or proverb; an accepted principle in an art or science.

AXIS, an imaginary line round which an object rotates, or around which a body is symmetrical; the second cervical vertebra (anat.).

AX-LES-THERMES (42° 43' N., 1° 48' E.), watering-place, Ariège, France; sulphur springs.

AXMINSTER (50° 46' N., 2° 59' W.), town, river Axe, Devonshire, England; famous carpets; brushes. Pop. (1911) 6800.

AXOLOTL (*Amblystoma*), larvæ salamanders, indigenous to lakes in Mexico and the E. and W. of the U.S.A.; they closely resemble the Brit. newt larvæ, but attain a length of 11 in., and are used as article of food. On account of their being able to reproduce before completing metamorphosis by losing external gills, they were for some time classified as Perennibranchiates; the Mexican name has now been extended to branchiate newts generally. Under suitable conditions, however, the a. can undergo normal metamorphosis; see H. Gadov, *Nature*, lxxv. (1903).

AXSTONE, AXESTONE, variety of jade used by natives of New Zealand, South Sea Islands, etc., for making axes.

AXUM (14° 7' N., 38° 44' E.), ancient town, Tigre, Abyssinia; formerly capital; religious centre; interesting ruins.

AYACUCHO (12° 40' S., 74° 6' W.), town and department, formerly called *Guamanga*, Peru; here Peruvians finally defeated Spaniards, 1824.

AYAH (Span. *aya*), term employed by English for native Indian nurse.

AYALA, DON PEDRO LOPEZ DE (1332-1407), Span. soldier, historian, and poet; wrote chronicle of the four Castilian kings under whom he lived, and also some satirical and didactic poetry. He was taken prisoner by the Black Prince at *Najera* (1367).

AYALA Y HERRERA, ADELARDO LOPEZ DE (1828-79), Span. politician and dramatist; his political sympathies constantly varied; he took part in the revolution of 1868, but later, reverting to Conservative

principles, he became a member of Alfonso XII's Cabinet; wrote many plays, and some lyrical poetry. *Complete Dramatic Works*, 7 vols., Madrid, 1881-85.

AYE-AYE, subfamily (*Ohiromyinae*) of Malagasy Lemuridae.

AYESHA (d. 677), childless wife and constant companion of Muhammad; on his death she secured succession as caliph to her f., Abu-Bekr, 632, but they were finally defeated by Ali Ben Abu Talib (q.v.) in 656.

AYLESBURY (51° 49' N., 0° 49' W.), market town, Buckinghamshire, England; straw manufactures; ducks. Pop. (1911) 11,045.

AYLESFORD (51° 18' N., 0° 29' E.), town, Kent, England; scene of battle, 455 A.D., between Britons and Saxons; Kit's Coty House is near. See **STANDING STONES**.

AYLESFORD, HENEAGE FINCH, 1ST EARL OF (1649-1719), Eng. lawyer; s. of 1st earl of Nottingham; became Solicitor-General; engaged in trial of Algernon Sidney, and was counsel for King James in trial of Titus Oates for libel; held to be one of the finest orators of his period.

AYMARA, Indian tribe who were found in subjection to Incas at time of Span. conquest. They now live chiefly in Bolivia and some parts of Southern Peru.

AYMESTRY LIMESTONE, between Upper and Lower Ludlow shales of Silurian. *Pentamerus knightii* is the leading fossil.

AYMON, romance of XIII.-cent. 'Fr. cycle,' about A., Count of Dordogne, and his four sons, Alard, Richard, Guichard, and Renaud; ascribed to Villeneuve.

AYR (55° 28' N., 4° 36' W.), royal burgh, chief town of Ayrshire, mouth of river A.; charter granted by William the Lion, 1200; famous old bridge; associated with poet Burns; town hall, academy; chief Scot. horse-racing centre; shipbuilding, shoemaking, carpets, etc. Pop. (1911) 32,955.

AYRER, JAKOB (d. 1605), Ger. dramatist; lived chiefly at Nuremberg, where there was pub. a collection of his tragedies, comedies, and Shrovetide plays under the title of *Opus Theatricum* (1618).

AYRES, JOHN (c. 1680-1700), writer on calligraphy; made Ital. script fashionable in England.

AYRSHIRE (55° 32' N., 4° 20' W.), county, S.W. Scotland; area, 724,523 acres; famous for early potatoes, dairy-farming, cheese; coal-fields, ironworks; fireclay, limestone, and honestone deposits; carpets, tweeds, cottons, chemicals, leather, tools, fisheries; chief seaports, Ayr (chief town), Ardrossan, Girvan, Troon, Largs; watered by Ayr, Stinchar, Doon, Irvine, Girvan, etc.; hilly districts in N. and S.; chief lake, Loch Doon; represented by two M.P.'s; some Roman remains and monastic ruins; scene of Alexander's defeat of Norwegians in 1263, and of several victories gained by Wallace and Bruce over Edward I.; took an active part in the Covenanting movement; known as 'the land of Burns,' after its most distinguished native. Pop. (1911) 268,300.

AYRTON, WILLIAM EDWARD (1847-1908), Eng. physicist; invented electrical measuring apparatus; Royal medallist, 1906. His wife (d. 1903) was also a scientist; author of *Electric Arc* (1902); discoverer of causes of sand-ripples on seashore, etc.

AYSCOUGH, SAMUEL (1745-1804), Eng. librarian; called 'The Prince of Indexers'; s. of a Nottingham printer, he migrated to London in early life and secured a position at the Brit. Museum; had a large share in the 1787 Catalogue; indexed ancient rolls and charters, and prepared Shakespeare Concordance.

AYSCUE, SIR GEORGE (d. 1671), Eng. admiral; employed with Blake in the reduction of Soilly (1651); later in W. Indies; served under Monk in the Four Days' Battle (June 11-14, 1666), but his flagship was captured by the Dutch and he remained for some time prisoner in Holland.

AYTOUN, SIR ROBERT (1670-1638), Scot. poet; held Court offices under James I. and Charles I.; knighted, 1612; wrote poems in Latin and English, his

best known being *Diophantus and Charidora*. He is sometimes credited with an early version of *Auld Lang Syne*.

AYTOUN, WILLIAM EDMONSTOUNE (1813-65), Scot. poet; wrote *Lays of the Scottish Cavaliers* (1848); part author of *Bon Gaultier Ballads* (1855), with Sir Theodore Martin, who also assisted him in the translation of *Poems and Ballads of Goethe* (1858); prof. of Rhetoric at Edinburgh Univ. (1845).

AYUNTAMIENTO, Span. municipal council, administrative district, or town hall.

AYUTHIA (14° 28' N., 100° 36' E.), city, Siam; formerly capital; ruined palaces, temples.

AZAIS, PIERRE HYACINTHE (1766-1845), Fr. philosopher; his chief work was *Des Compensations dans les Destinées Humaines* (1809), which won the approbation of Napoleon.

AZALE, extract of madder-flower used as dye.

AZALEA, genus of plants belonging to order Ericaceae, resembling the rhododendron; native of N. America and S. Europe; has delicately tinted flowers, white to dark red.

AZAMGARH (26° 3' N., 83° 13' E.), city and district, Gorakhpur division, United Provinces, India; city, on Tons, founded 1665, by Azam Khan.

AZAN, public call to prayer in Muhammadan countries. This is announced from the mosque, twice daily, by the Muezzin, who stands with his face towards Mecca.

AZARD, DON JOSÉ NICHOLAS DE (1731-1804), Span. diplomatist; ambassador to Rome and Paris; he was the unwilling instrument in negotiations which led to subjection of Spain to Napoleon, which embittered his after-life.

AZAY-LE-RIDEAU (47° 17' N., 0° 30' E.), town, Indre-et-Loire, France; Renaissance château.

AZAZEL (Hebr.).—(1) Name given to scapegoat chosen to bear sins of people into wilderness, from allusion in *Leviticus* 16. (2) Evil spirit ranking next to Satan; Satan's standard-bearer in *Paradise Lost*.

AZEGLIO, MASSIMO TAPARELLI, MARQUIS D' (1798-1866), Ital. statesman and author; in early life maintained himself as an artist; m. dau. of novelist, Alessandro Manzoni, and himself pub. two hist. novels in style of his father-in-law; later entered political arena, and became premier under Charles Albert, king of Sardinia, and his successor, Victor Emmanuel II.

AZERBAIJAN (37° 50' N., 46° E.), mountainous province, N.W. Persia; area, c. 40,000 sq. miles; grain, cotton, hemp, tobacco, saffron; lead, copper, tin; chief town, Tabriz. Pop. c. 2,000,000.

AZIMUTH is the angle, measured along the horizon, between where a vertical plane passing through a given star cuts it, and the meridian of the observer.

AZINCOURT, see **AGINCOURT**.

AZO-COMPOUNDS, organic compounds containing —N=N— combined with aromatic radicals; many are of value as yellow, red, or brown colouring agents. See **DYEING**.

AZOIMIDE (*Hydrazoic Acid*) (N₃H), colourless, malodorous, highly explosive liquid; B.P. 30° C.; first isolated by T. Curtius. All the salts are explosive.

AZORES (37° to 40° N., 25° to 31° W.), three groups of hilly islands in Atlantic belonging to Portugal, of which they are treated as an integral part; extend over length of c. 400 miles; of volcanic origin, hilly. Climate is temperate. A. have frequently suffered from earthquakes. Hot mineral springs occur. Largest island is São Miguel (41 by 9½ miles); smallest, Corvo (4½ by 3 miles); area, c. 900 sq. miles. Eastern group comprises Santa Maria, São Miguel, Formigas Rocks; central, Terceira, Graciosa, São Jorge, Pico, Fayal; western, Flores, Corvo. A. were known to Carthaginians, Normans, and Arabs; discovered by Portuguese, 1440; Spanish possession, 1580-1840; Flores in the A. scene of heroic exploit of Sir Richard

Grenville against Spain in *Revenge*, 1691; scene of disturbances caused by Dom Miguel of Portugal, 1828-33. A. produce wine, pine-apples, oranges, bananas, grain, pulse, tobacco, sweet potatoes; industries include butter and cheese making, distilling; export above productions, also pork, beef. Best harbour is at Horta, Fayal Island. Capital, Angra in Terceira. Pop. 260,000, mostly Portuguese.

AZOTE, Lavoisier's name for nitrogen (*q.v.*).

AZOTH, panacea of Paracelsus; alchemistic for mercury.

AZOTUS, ASHDOD (31° 44' N., 34° 43' E.), village, Palestine; one of the five Philistine cities.

AZOV (47° 2' N., 39° 28' E.), town, Don Cossacks, Russia; fisheries. Pop. 26,000. **Azov, Sea of** (46° N., 36° 30' E.), arm of Black Sea, S. of Russia; very shallow; gradually silting up; valuable fisheries; caviare and isinglass.

AZPEITIA (43° 11' N., 2° 10' W.), town, Guipuzcoa, Spain; birthplace of Loyola. Pop. 6500.

AZRAEL, RAPHAEL, one of four archangels of Muhammadan celestial hierarchy; sent by Allah to separate soul from body.

AZTECS, Nahuatl Ind. tribe which founded the Mexican empire, subsequently conquered by Cortes. Their otherwise high state of civilisation was stained by wholesale human sacrifices. See MEXICO.

AZUAGA (38° 17' N., 5° 29' W.), town, Badajoz, Spain; woollen goods. Pop. 12,000.

AZUAY (3° 20' S., 78° 51' W.), southern province, Ecuador; capital, Cuenca; minerals, grain. Pop. c. 150,000.

AZUL—(1) (13° 1' S., 76° 25' W.) town, Peru. (2) (36° 40' S., 59° 50' W.) town, Argentina. Pop. c. 8000.

AZUNI, DOMENICO ALBERTO (1749-1827), Ital. jurist; wrote number of works on maritime law; also hist. and geographical account of Sardinia.

AZURARA, GOMES EANNES DE (c. 1470), Portug. chronicler; wrote *Chronicle of the Discovery and Conquest of Guinea*, which is a principal authority for the life and voyages of Prince Henry the Navigator.

AZURE, blue colour, supposed to be derived from name of the stone lapis lazuli; in heraldry is represented by horizontal lines.

AZURINE, blue roach. See CARPS.

AZURITE (*Chessylite*), $2\text{CuCO}_3 \cdot \text{Cu}(\text{OH})_2$, mineral occurring with malachite in copper-ore deposits. See MALACHITE.

AZYME, unleavened loaf used by Jews in Passover ceremony.

AZYMITES, term applied by the Eastern to the Western church because of its use of unleavened bread (*azyme*=unleavened).

B, second letter of Eng. alphabet, a like symbol occupying the same position in Hebrew, Gk., and various other alphabets; called by the Phoenicians and Hebrews *beth*, whence is derived the Gk. *beta*.

BAADER, FRANZ XAVER VON (1765-1841). Ger. philosopher and theologian; Prof. of Philosophy at Munich (1826); pub. *Fermenta Cognitionis* (1822-25), in which he opposes the trend of modern philosophy. He was a disciple of Jacob Boehme, and believed that an attempt to realise the divine life should be man's ultimate ambition.

BAAL, a Semitic word meaning 'lord' or 'husband,' and sometimes used in that sense in Hebrew; used more specifically of the God of the Canaanites, corresponding to the Babylonian Bel. He was often worshipped on mountain-tops, and his cult was accompanied by immoral rites. In *II. Kings* 1 Ahaziah wishes to seek information of Baal-zobub (Lord of flies), the god of Ekron. Raisin-cakes were eaten at his sacrificial feasts (*Hosea* 3).

BAALBEK (34° N., 36° 10' E.), ancient city, Syria, on lower slope of Anti-Libanus; formerly magnificent; has remains of three temples, of which greatest was built by Antoninus Pius; sacked by Saracens in 748, and by Timur in 1400; present village is to E. of ruins; has Brit. mission school.

BAARN (52° 12' N., 5° 17' E.), village, Utrecht, Holland; summer resort.

BAAS, Kafir form of address borrowed from Dutch word signifying captain; cf. *Boss*.

BABA (Arab., Persian, Turk. 'father'), title of respect similar to R.C. 'Father' when addressing priests.

BABADAG (44° 54' N., 28° 52' E.), town, Tulcea, Rumania.

BABANANGO, district, Natal, S. Africa.

BABBAGE, CHARLES (1792-1871), Eng. mathematician and mechanician; designed but did not finish calculating machines; author of mathematical works.

BABEL, name given to city of Babylon, somewhere in the neighbourhood of which place the descendants of Noah (*Genesis* 11), after the deluge, attempted to build a tower which should reach up to heaven, but God punished the builders with a confusion of tongues; derived from Hebrew, *babel*, 'to confound.'

BAB-EL-MANDEB (13° N., 43° 10' E.), strait (15 miles wide) between Arabia and Africa, forming entrance to Red Sea; means 'Gate of Tears' owing to record of shipwrecks; there is now a lighthouse on Perim in middle of strait.

BABENBERG, Franconian family, dating back to IX. cent., who held the Austrian duchy before the Hapsburgs. The male line became extinct in 1246.

BABER, 'the tiger,' surname of ZAHIR UD-DIN MUHAMMAD (1483-1530), founder of the Mogul dynasty; s. of Omar Sheik, ruler of Ferghana (Russ. Turkestan), and descended from Timur; was a great soldier, and conquered all northern India.

Caldecott, *Life of B.*, 1844; Lane-Pool, *Baber*, 1899.

BABEUF, FRANÇOIS NOEL (1762-97), Fr. agitator and journalist; originally a land surveyor, he became an adherent of the extreme party at the outbreak of the Revolution (1789); was commended by Marat, but opposed the aims of Robespierre during the Terror. He launched a paper called the *Tribune of the People* in which, over the signature of 'Gracchus Babeuf,' he advocated a system of communism by which all property should be distributed with the most strict equality. To further his views, B. associated himself with a plot to overthrow the Directory, which, being discovered, B. was guillotined.

BABISM, religion of a Muhammadan sect, founded 1844, by Mirzá 'Alí Muhammad, which acknowledges Muhammad as a prophet, and the *Koran* as an inspired book, but refuses to accept the finality of either, and denies the doctrine of bodily resurrection.

BABINGTON, ANTHONY (1561-86), Eng. R.C. gentleman (of Derbyshire), who had been page to

Mary Queen of Scots at Sheffield, and later became head of a plot to assassinate Elizabeth and place Mary on the throne. The conspiracy was discovered, and B. and the rest of the plotters were hanged at Tyburn. Its discovery also led to Mary's execution.

BABINGTON, CHURCHILL (1821-89), Eng. classical scholar; made his reputation as a translator of the writings of Hypereides from the papyri discovered at Thebes (1847-56).

BABIRUSA, BABIROUSSA (*Babirusa alfurus*), the 'pig-deer' of Buru and Celebes. It differs from the genus *Sus* in having ever-growing canines. Those of the upper jaw grow upwards through the skin of the face and curl backwards, giving the animal an appearance of a pig with four horns.

BABLE, Sp. dialect spoken in Asturias.

BABOON, African monkey of genus *Papio* or *Cynocephalus*, with fore and hind limbs nearly equal, being thus adapted for a terrestrial rather than an arboreal existence. The *Mandrill* (q.v.) and *Chacma* (q.v.) are examples.

BABRIUS, Gk. fabulist, of whose life nothing is known. A MS. containing 123 of his fables was discovered in 1842, at St. Laura's Convent, Mount Athos, and is now in Brit. Museum.

BABU, BABOO, term for 'Mr.' or 'Esquire,' applied to Hindu gentlemen; also a Hindu clerk; applied sometimes disparagingly to an Indian who has been educated in England.

BABUL TREE, Indian acacia, gives hard timber and a medicinal and edible gum.

BABUYANES (10° 20' N., 121° 10' E.), volcanic islands, Philippines; produce fruits, cereals. Pop. c. 10,000.

BABY.—At birth a normal baby weighs about 7½ lb. This weight is doubled at six months (15 lb.) and trebled at twelve months (22½ lb.), but babies fed artificially increase in weight less regularly than breast-fed babies. An infant is normally put to the breast during the first two or three days of life for five or ten minutes at a time, at intervals of six hours, thus obtaining colostrum, which has a beneficial effect on the digestive system, and stimulating the secretion of milk. During the first month the baby is put to the breast at intervals of two hours during the day and twice during the night, for fifteen minutes at a time; during the second and third months, at intervals of two and a half hours during the day and once during the night; during the fourth and fifth months at intervals of three hours during the day and once during the night, towards the end of the fifth month feeding at night being unnecessary.

Weaning is generally a gradual process, at the commencement of the ninth month one of the nursing periods in the morning being omitted and artificial feeding substituted, while in another week an afternoon nursing period is omitted in place of artificial feeding, and so on. The best bottles are boat-shaped, with a rubber teat at one end and a screw stopper or rubber valve at the other. During lactation the baby is sometimes accustomed to artificial feeding by giving it a bottle once a day containing a little warm water which has been boiled. Cow's milk, scalded and modified by dilution with water and the addition of cream and sugar, and, in special cases, bicarbonate of soda, etc., is the best artificial food for the baby; at the second month, when artificial feeding is necessary so early, 2 parts of water to 1 of milk, at the fourth month equal parts, at the sixth month 1 part of water to 2 of milk, and at the eighth pure milk—cream and sugar begun in small quantities and increased, the maximum amount of cream to be 1 tablespoonful, and of sugar 1 dessertspoonful. During the last three or four months of the first year, some farinaceous food can be added to the milk diet.

Baby-Farming, the taking of children to nurse for payment. As they were mostly illegitimate, it was to interest of parents that such infants should not live,

and the mortality, previous to 1871, was enormous. But by Acts passed in 1872, 1897, 1907, and 1908 nurses receiving such children are placed under strict supervision, and severe penalties are imposed for evasion of laws relating to them.

Chavasse, *Advice to a Mother; The Baby* (Jack, 1912).

BABYLON—Heb. *Babel* (*q.v.*), gate of the god—(32° 35' N., 44° 40' E.), ancient town, Mesopotamia, on E. bank of Euphrates, capital of Babylonian empire; most important between XIX. and VI. cent's B.C.; was ruined by Sennacherib of Assyria, c. 690 B.C., but regained prosperity under Nabopolassar and Nebuchadnezzar; conquered by Cyrus, 539; by Alexander the Great, 331; began to decline under Seleucids (*q.v.*), of whose kingdom Seleucia (near by) became capital. The remains of the Great B. show it to have been smaller than painted; traces of three walls still to be seen; German excavations, 1899 onwards, have revealed sites of palaces, etc. Adjoining that of Nebu-

civilised people of B. of whom we have historical knowledge; they migrated from Arabia in very early times, different tribes establishing themselves in different cities, which were for long time engaged in war with each other. Little is known of early kings, many of whom are mentioned in inscriptions. Kings of Lagash were apparently predominant in 5th and 4th millenniums until superseded by Sargon I. of Agadé, c. 3800 B.C. Later arose dynasties of Ur (3000 B.C.), Isin (2600 B.C.), Larsa (2500 B.C.), after which Babylon came to front. First Babylonian dynasty was established c. 2400 B.C., by Canaanite kings, eleven of whom ruled; second dynasty, of Shishku, lasted from c. 2100 to 1732 B.C.; third, the Kassites, flourished from c. 1700 to 1130; fourth, of Pashe, 1130 to 1000, including Nebuchadnezzar I., who extended dominions to Mediterranean. After this came several changes of dynasty, Elamites obtaining control for short time. Chaldean immigrations began in X. cent., and sovereignty of B. was



chadnezzar II. traces of irrigation works probably mark site of *Hanging Gardens* of Semiramis, who represents fabulous luxury of B.; built in terrace form and supported on arches resting upon other arches, they were one of seven wonders of the world. The traditional worldliness, luxury, and vice of B. furnished Puritans of XVI. (and still more) XVII. cent's with an epithet to describe Rome, symbolism of *Revelation* being transferred to current events; the 'Great B.' is a common figure of speech applied to large cities.

BABYLONIA, ancient country of Mesopotamia, lying S. of Assyria (*q.v.*); low-lying district; name taken from ancient capital, Babylon. Babylonian civilisation probably originated with ancient Sumerians, of whom nothing is known except that they invented cuneiform writing, found in oldest records extant dating to 4th millennium B.C. Some authorities consider Semites to be originators of Babylonian civilisation, holding that Sumerian language is priestly form of Semitic language. At all events, Semites are first

contested by Chaldea, Assyria, and Elam, Babylonian natives becoming less able to preserve independence.

Chaldea attained supremacy in X. cent., and under Chaldean kings B. again became powerful. Wars against Assyria continued, latter becoming important under Tiglathpileser III., in VIII. cent., who established protectorate over Nabu-Natsir, king of B., and later had himself proclaimed king under name Pulu. Shalmaneser IV. of Assyria also reigned in B. as Ululai; after his death revolution occurred; Sargon II. became king of Assyria, Marduk-Aplu-Iddin II. of B.; latter, a Chaldean prince, was defeated by former, and also by his successor, Sennacherib, whose son, Ashur-Nadim-Shum, became king of B. in 699. Various changes and wars subsequently occurred, and long struggle between Chaldeans and Assyrians ended in victory of former in late XII. cent., when B. became Chaldean, Assyria having declined after death of Assur-Bani-Pal in 626. New Babylonian kingdom flourished under

Nebuchadrezzar, but declined after his death in 561. Last king of B., Nabuna'id, was subdued by Cyrus of Persia in 538; B. henceforth held by Persia, till latter conquered by Alexander the Great, after whose death country became of no importance.

Babylonian Law is known to us from a fairly large number of ancient records and archaeological evidence from the very remote past down to about the time of Christ. Even when Babylon had ceased to exist as a state its law survived, and some of it was taken over by Muhammadan codes (*q.v.*). But the discovery of the Code of Hammurabi (king of Babylon about 2250 B.C.) gave a much more detailed knowledge of it than was possible before. It shows a highly developed political and social system then in existence. The community was divided into three classes—first, a ruling class, including those of noble and professional rank, an intermediate class whose exact scope and function it is difficult to determine, and the slaves. Commerce was regulated, and a regular financial and banking system had come into being. An elaborate system of waterworks kept the country irrigated. The criminal law inflicted many penalties—death by hanging or burning, mutilation on the principle 'Let the punishment fit the crime,' and financial penalties. Before he could be punished a man had to be proved guilty. Trade was carried on by caravans which often journeyed far outside Babylonia. Marriage had to be accompanied by payment to the bride's f., but the money was generally returned to the bride. The wife was still considered to belong to her own family, and her husband could divorce her if he chose, though he had to relinquish the children. Immorality was punished with death or other penalties. See Harper, *Code of Hammurabi*; Cook, *Laws of Moses and Code of Hammurabi*.

Religion.—During the period of the development of the Babylonian and Assyrian religion changes took place, but the primitive belief was that every object in nature housed a spirit which collectively governed the actions of mankind. Thus arose a fetish-worship, with its medicine-men, who professed to combat the malevolent spirits who were the cause of disease and sickness. In course of time those multitudinous spirits were gathered into a great hierarchy, whence arose the gods of the heavens, the earth, and the underworld. Of these deities Ea was lord of the sea; Dav-kina, his consort, the earth-goddess; their children being Tammuz and Istar, both of whom were held in great veneration throughout Babylonia and the whole of Western Asia; there were also Samas, the sun-god; Mul-il, lord of the nether world; his consort, Ninkigat, and their son Namtar, who spread disease and death. The powers of all these gods, however, eventually became absorbed in the paramount Baal (*q.v.*), the f. and creator of the universe.—See A. H. Sayce, *Religion of the Ancient Babylonians* (1887); L. W. King, *Babylonian Religion and Mythology* (1898).

Babylonian Captivity, name given to the deportation of the Jews from Judea to Babylon by Nebuchadrezzar; they were allowed to return to their own country when Cyrus conquered Babylonia (537 B.C.); name also applied to residence of Popes at Avignon, 1300-77.

BACAU, BAKAU (46° 36' N., 26° 50' E.), town, Moldavia, Rumania; chief commercial centre.

BACCARAT, gambling game, with cards, of complicated and varying rules, played by from three to eleven persons. It is forbidden in many clubs. The origin of the name is unknown. It has been popular in France for a long period. Several b. clubs raided in London, 1912-13.

BACCARAT (48° 28' N., 6° 43' E.), town, France; manufactures glass. Pop. c. 7000.

BACCHANALIA (Lat.), riotous orgies held at Rome and other towns in honour of the god Dionysus (Bacchus). At these festivals the grossest debaucheries were committed, which led to their partial suppression throughout Italy (186 A.D.).

BACCHIUS, metrical foot (u —).

BACCHUS, see DIONYSUS.

BACCHYLIDES (fl. 467 B.C.), Gk. lyric poet; nephew of Simonides; wrote odes, elegies, and drinking songs.

BACCIO D'AGNOLO (1460-1543), Ital. wood-carver, architect, and sculptor; did much carving for Church of Santa Maria Novella and Palazzo Vecchio, Florence; was also architect of the Bartolini Palace, the Villa Borghese, and the campanile of Santo Spirito.

BACCIOCHI, FELICE PASQUALE (1762-1841), Corsican who served in Italy under Napoleon, whose eldest sister, Elisa, he m., 1797; cr. Prince of Lucca and Piombino (1805). Their dau., NAPOLEONE ELISA (1806-69), m. Count Camerata.

BACH, JOHANN SEBASTIAN (1685-1750), Ger. composer; b. Eisenach, where his f. was court and town musician; member of a family which had produced musicians for several generations; lost his f. at age of ten, and was taken under the care of an elder bro., Johann Christoph, organist at Ohrdruf. Apparently the boy's progress was too rapid for his guardian, who forbade him the use of certain compositions of the earlier masters. The lad, however, managed to obtain secret possession of the volume at night, spent six months in laborious copying by moonlight only to have the work confiscated by Christoph when it was discovered, while the strain put upon Sebastian's eyesight undoubtedly did much to hasten the blindness which overtook him. At the age of fifteen he was thrown upon his own resources by the death of his brother. He went to Lüneburg, and having a fine soprano voice became a member of the choir at St. Michael's School, remaining after his voice had broken as violinist and player upon the harpsichord. When nineteen he became organist at Arnstadt, later moved for a year to Mülhausen, and secured a long engagement as Kapellmeister to the Köthen court. Here he devoted himself to composition, producing some of his greatest works. Eventually he went to Leipzig, where the remainder of his life was spent.

All forms of composition were developed by B. to such an extent that his life marks an epoch in the history of music, and he is unrivalled in ease of intricate composition. His orchestral works had much influence on those of succeeding composers, his violin and violoncello compositions are held in the highest esteem, and he was the greatest organist of his time. He had an inventive faculty, and introduced a new method of fingering and a new system of tuning, both of which are universally employed to-day.

Several of B.'s sons achieved distinction as musicians: **Bach, Wilhelm Friedeman** (1710-84), eldest son; organist and skilful composer; died in poverty. **Bach, Karl Philipp Emanuel** (1714-88), third s.; composed oratorios, cantatas, sonatas, etc.; his work was held in great esteem by Mozart, Beethoven, and other composers. **Bach, Johann Christian** (1735-82), eleventh and youngest son; the 'Eng. B.'; became music master to Queen Charlotte, 1762.

Lane Poole, *Bach* (Great Musicians Series); Parry, *Studies of Great Composers*.

BACHARACH (53° 3' N., 7° 47' E.), town, on Rhine, Germany; wine.

BACHAUMONT, FRANÇOIS (1624-1702), Fr. author; wrote *Voyage de Chapelle et B.* in collaboration with Chapelle; gave name to Fronde.

BACHE, ALEXANDER DALLAS (1806-67), Amer. physicist; superintendent U.S.A. coast survey.

BACHE, FRANCIS EDWARD (1833-58), and **WALTER BACHE** (1842-88), Eng. musicians; were bro's; former, composer of operettas and pianoforte pieces; latter, Prof. of Pianoforte at Royal Academy of Music; see C. Bache, *Brother Musicians*, 1901.

BACHELLER, IRVING (1859-), Amer. author; editorial staff of *New York World* (1898-1900); achieved success as novelist with *Eben Holden* (1900); later works include *D'ri and I* (1901), *Silas Strong* (1906), and *Keeping up with Lissie* (1911).

BACHELOR (supposed to be derived from Low

Lat. *baccalaris*, *baccalaris*, tenant of a small farm), term applied to an unmarried person, or person holding an inferior degree or standing—thus knight-b. was an inferior of a knight-banneret; an inferior grade of ecclesiastic; the lowest degree of a univ.

BACHIAN (0° 30' S., 127° 30' E.), fertile island, Molucca Sea, Dutch East Indies.

BACILLUS, see BACTERIOLOGY.

BACK, SIR GEORGE (1796-1878), Arctic explorer; started 1833 in search of Capt. Ross; discovered Artillery Lake, 1834, and traced Great Fish or B.'s River to mouth in Frozen Ocean; among other honours, made admiral, 1857.

BACKARGANJ (22° 30' N., 90° 20' E.), district, Dacca, Brit. India: part of Ganges and Brahmaputra delta, and in S. forest tracts, Sunderbunds; fertile, healthy country, intersected by rivers and canals; great rice crops; area, 4542 sq. miles. Pop. 2,291,752.

BACK-BOND, Scot. legal term for a document qualifying an earlier deed.

BACK-BONE, spinal column. See SKELETON.

BACKGAMMON, game of skill, played on a folding board, or table, each half of which is marked off into twelve *fêches*, or points, six at each end. It is played by two persons, each player having fifteen draught-like pieces, the movements of which are governed by the casting of dice.

BACKHUYSEN, LUDOLF (1631-1708), Dutch artist, famous for his realistic seascapes and nautical studies.

BACKNANG (5° 10' N., 105° W.), river, 560 miles, Canada; enters inlet of Arctic Ocean.

BACKSCRATCHER, long slender rod, made of various materials, with a carved human hand affixed, or bird's claw, and used for the purpose suggested by its name; common in XVIII. and early part of XIX. cent's, and now much sought after by collectors.

BACKSWORD, sword with one edge; singlestick.

BACKWELL, EDWARD (d. 1883), Eng. goldsmith, who introduced modern system of banking into Eng.

BACKWOODS, uncivilised parts of Canada and U.S.A.

BACON, DELIA (1811-59), Amer. authoress; dau. of David B., missionary among the Indians and founder of town of Tallmadge, Ohio. She is remembered only by her *Philosophy of the Plays of Shakespeare Unfolded* (1857), in which she sought to prove that Shakespeare's plays were written by Francis Bacon, Spenser, and Raleigh. In the preparation of this work she spent some years in England, during which time she became insane.

BACON, FRANCIS, LORD VERULAM AND VISCOUNT ST. ALBANS (1561-1626), Eng. philosopher, essayist, and statesman; youngest s. of Sir Nicholas B. (q.v.), and nephew of William Cecil, 'the Great Lord Burghley'; b. London, Jan. 22; ed. privately, and later at Trinity Coll., Cambridge; subsequently entered Gray's Inn (1576), was called to the Bar (1582), and became a bencher of his Inn (1586). While a student at Cambridge he attracted the favourable notice of Queen Elizabeth, who dubbed him 'the Young Lord-Keeper.' He accompanied Sir Amyas Paulet on a mission to France (1577); applied to his powerful uncle for a Court appointment, but was unsuccessful. His success at the Bar, however, was considerable, and he entered the political arena as member for Melcombe Regis (1584), sitting subsequently for Taunton, Liverpool, Middlesex, and Southampton. He obtained from Burghley (1589) the reversion of the clerkship of the Star Chamber (worth £4600 per year), but this did not fall vacant until 1608. In the meantime he attached himself to the Earl of Essex, Burghley's rival at Court, who bestowed many favours upon him. B. commenced his public life with an inordinate belief in himself, and was throughout his life servile to those placed above him, and treacherous to his friends.

With the downfall of Essex, B. had no compunc-

tion in endeavouring to secure the Earl's conviction for treason, while at the same time he sought to exonerate himself. With the accession of James I. B. lost no time in bringing his old arts of flattery and obsequiousness to bear upon the new monarch, with the result that he was knighted (1603); became Solicitor-General (1607); Attorney-General (1613); Lord-Keeper (1618); Lord-Chancellor, and Baron Verulam (1619), and was cr. Viscount St. Albans (1621). These latter titles were derived from *Verulamium*, the Latin name of St. Albans, near which his estate lay. B.'s rise to greatness was followed by his immediate downfall, for on March 17, 1621, charges of corruption were laid against him by the Commons. He attempted no defence, merely asking his judges 'to be merciful to a broken reed.' Having been found guilty, B. was fined £40,000 (which fine was remitted), was committed to the Tower during the king's pleasure, and was declared incapable of again holding a public office.

B. was now able, for the remainder of his life, to devote his energies entirely to the literary and philosophical writings in which he really achieved greatness, and which constitute his enduring title to fame. Dissatisfied with the Aristotelian system of deductive logic he evolved a theory based on inductive methods which did not rest solely upon enumeration of phenomena, but upon their proper selection and arrangement. In brief, the substance of his philosophy is that man is merely the interpreter of Nature, and that all knowledge is the result of experience. As the pioneer of scientific induction, he is in some sense the parent of the school of Eng. philosophy developed later by Hobbes, Locke, and Hume, and of modern science. B.'s *Advancement of Learning* was pub. 1605; *Wisdom of the Ancients* (1609); *Novum Organum* (1620); *Henry VII.* and other works (1622); *Essays* (complete) and *Apophthegms* (1625). In a purely literary sense B. is seen at his best in his *Essays*, which combine a high sense of style with much practical wisdom and keen observation of life; and in his *Henry VII.*, which displays much scholarly research, he characterises Henry with remarkable skill, and gives an attractive and animated account of that momentous reign. The attempts by some writers to father upon B. the plays of Shakespeare need not be seriously considered.

Francis Bacon, Skemp (Jack, 1912).

BACON, JOHN (1740-99), Eng. sculptor; patronised by George III.; examples of his work are to be found in St. Paul's Cathedral, Christ Church and Pembroke Colleges, Oxford, Bath Abbey, and Bristol Cathedral.

BACON, LEONARD (1802-81), Amer. congregationalist; bro. of Delia B.; pastor at Newhaven, Connecticut (1825-81); exercised considerable influence upon Amer. theol., and was regarded as the leading Congregationalist of his time. He was opposed to slavery, wrote a number of hymns, and pub. *Slavery Discussed* (1846), *Thirteen Historical Discourses, Genesis of the New England Churches*, etc.

BACON, SIR NICHOLAS (1509-79), Lord-Keeper of the Great Seal of England; was the f., by his second wife, of Francis Bacon, Viscount St. Albans; he seems to have possessed moral principles which were wanting in his more famous son; he lived respected and died regretted; founded a free grammar school at Redgrave.

BACON, ROGER (1214-94), Eng. philosopher and scientist; b. Ilchester; ed. at Oxford; said to have taken orders (1233), and later continued his studies at Univ. of Paris, where he acquired some renown, took the degree of D.D., and was familiarly known as *Doctor Mirabilis*. He joined the Franciscans and was imprisoned on a charge of practising magic. B.'s chief works were *Opus Majus* (a treatise on maths., logic, grammar, physics, etc.), *Opus Secundum*, and *Opus Tertium*. He was a firm believer in astrology and the use of the philosopher's stone; was the inventor

of the magnifying glass; several of his scientific generalisations were far in advance of his time. He suggested several inventions, such as the telescope, air-pump, diving-bell, camera obscura, and is said to have invented gunpowder.

See Brewer's preface to *Opera Inedita* (Rolls Series).

BACONTHORPE, JOHN (d. 1346), Eng. Carmelite monk; known as 'the Resolute Doctor'; defended Averroism.

BACSANYI, JANOS (1763-1845), Hungarian poet and patriot; pub. *The Valour of the Magyars* (1785), edit. *Magyar Museum*, and wrote for the *Magyar Minerva*.

BACTERIOLOGY, the study of bacteria, a general term including the minute vegetable micro-organisms of the class *schizomycetes* (splitting fungi), occurring in the air, water, and the soil, as well as in the tissues of living plants and animals and their products. Bacteria may be divided into two classes, those of a simpler and lower type, and those which are somewhat more highly developed. The former are unicellular masses of protoplasm, without definite nuclei and without chlorophyll, which multiply by fission, some having little prolongations of their outer covering (certain authorities consider them rather protrusions of the protoplasmic cell contents) in the form of cilia or flagella, which serve as means of propulsion. This class comprises the *coccus* form, a minute globule, the *bacillus*, a straight rod, and the *vibrio*, *spirillum*, and *spirochete*, which are curved or spiral rods, some of which must be included among the higher types, as they really consist of several cells united end to end. In the process of reproduction the cell becomes more elongated, a septum forms longitudinally up the middle, and the cell splits along the septum, forming two cells which become exactly like the parent cell. This process may go on indefinitely, so that enormous numbers of bacteria may develop in a short time, and when developed in a liquid they may become glued together by their swollen cell-walls, and form a film on the surface or a clump floating in the liquid, called a *zooglyza*.

The second class comprises filaments composed of cells which remain united end to end after division, the structure of each element being the same as in the lower types, and also filaments in which some of the cells form *spores* for the purpose of the reproduction of the species. A spore commences by the appearance of a granule round which the protoplasm in the cell gathers, a fine membrane forming and enveloping the mass. This is very resistant and can withstand great extremes of temperature, and under suitable conditions it swells and develops into a cell like that from which it was originally formed.

The growth of bacteria depends on (a) the supply of nourishment, (b) the presence of moisture, (c) the presence of certain gases, (d) the temperature, and (e) light.

Most bacteria require organic matter as food, some requiring protein or carbohydrates, and all requiring nitrogen in some form or other, but a certain number can exist on inorganic food; while inorganic salts (phosphates, chlorides, etc.) are necessary for the life of all.

Moisture is necessary for the existence of all bacteria, although a number of species, particularly in the spore form, are able to live without it for some time.

Oxygen is a very important factor in the life of bacteria, which may be divided into those which require oxygen for existence (*aerobes*), those which cannot exist in the presence of oxygen (*anaerobes*), and those which can live either in the presence or absence of oxygen (*facultative anaerobes*). Carbon dioxide also prevents the growth of anaerobes to a certain extent.

There is a particular temperature, called the optimum temperature, at which each species of bacteria grows best, that for the bacteria commonly existing in the tissues of animals being between 36° and 38° C.; while the lowest temperature at which growth is ordin-

arily possible is 10° to 12° C., and the highest 43° to 46° C. Certain bacteria, called *thermophilic* bacteria, have been found, e.g., in putrefying animal excretions, which grow at a temperature as high as 70° C.

Sunlight is found to kill even extremely resistant bacteria after a very short time, the time required depending on the density of the medium in which the bacteria are; and it has been found by experiment that the green, violet, and ultra-violet rays of the spectrum are the most bactericidal.

Benefits of bacteria.—It is erroneous to imagine that all bacteria are harmful; the greater number of them are harmless and a large number are actually advantageous to man, in agriculture, certain fermentation processes, and other spheres of industry. There are species of bacteria in all cultivated soils which are able to form organic matter from inorganic sources by, for instance, obtaining carbon from carbon dioxide and nitrogen from ammonia, others combining nitrogen with other elements so as to compose substances which plants can absorb. On the roots of leguminous plants (beans, peas, etc.) there are little nodules containing great numbers of bacteria which bring the nitrogen of the air into combination with the soil, and such plants are not only able to live in poor, unmanured soils, but they actually enrich the soil they grow in. For this reason such plants are or should be included in all rotations of crops. The bacterial nodules are nominally only found on the roots of leguminous plants, but Prof. Bottomley, of King's Coll., London, has recently succeeded in producing them in other plants by a special method of infection.

Milk usually contains numbers of bacteria (e.g. *tubercle bacillus*) which are harmful to man, for which reason the milk should be sterilised before it is used as a food; but, in addition, it often contains bacteria which are not only harmless but impart desirable flavours to milk products, e.g. butter and cheese—a fact which is now being made use of by makers of dairy produce, who cultivate pure cultures of such bacteria and treat butter and cheese with them.

The preparation of tobacco and indigo and the process of tanning are other instances of the value of bacteria to man, for in the fermentations in these and similar processes bacteria play an important part.

Bacteria and disease.—It is, however, to the effects produced by pathogenic bacteria in man, and to the means of resisting and overcoming these effects, that most attention has been paid. As early as the XVII. cent. van Leeuwenhoek was able to describe bacteria with the aid of the primitive microscope. Müller divided them into two classes in 1773, while in 1838 Ehrenberg proposed quite an elaborate classification. Cohn, however, laid the foundations of the modern science by his researches and discoveries in 1853-75, which were developed by Pasteur, who first showed that disease could be caused by bacteria, and by Koch, by whom most of the modern methods of bacteriological study were instituted. Koch obtained a pure culture of the anthrax bacillus in 1876, and from that time to the present day the knowledge of the bacteria causing different specific diseases, of the effects of the bacteria on the tissues, and of the best methods of resisting and neutralising these effects, has gradually become more exact and complete. Before a bacterium can be universally regarded as the cause of a particular disease, it must be found in the affected tissues (by the use of the microscope), it must be obtained in a pure culture (i.e. quite separate from other organisms), and the disease must be reproduced in an animal by inoculation of it with a pure culture of the bacteria. For microscopic examination lenses of very high power must be employed, and the bacteria are detected by straining them in fine sections of the tissues by special and sometimes complicated methods, usually with solutions of aniline dyes. In growing particular bacteria outside the tissues separate from other species meat extracts

with gelatine or agar (a gelatinous substance obtained from certain seaweeds) and peptones (products of protein) are commonly used as nutritive culture media, while coagulated blood serum, milk, slices of potato, glucose, and other sugars with gelatin and other substances, are all frequently employed. To ascertain the effect of bacteria on animal tissues inoculations are made usually on rabbits, guinea-pigs, or mice. The effects produced in animal tissues by bacteria are due to the poisons or toxins formed by them, but little is yet known regarding the precise manner of the formation and the chemical composition of these toxins. The tissue changes are partly due to disturbances in the living cells caused by the toxins, and partly due to the reaction of the tissues against the invasion. The cells may degenerate or die, there may be acute inflammation or suppuration, hemorrhages, emigration of white corpuscles, exudation of fluid, increased growth of connective tissue, and fatty, hyaline, or waxy degenerations of cells. See **PATHOLOGY**.

Natural immunity.—The actual results of the invasion of the body by bacteria vary under different circumstances, depending on the virulence of the organisms, on the local resistance of the part infected, and on the general susceptibility of the individual. Animals may be naturally immune to diseases caused by different bacteria, or they may acquire immunity by successfully undergoing an attack of a particular disease, or through one or other of the methods of inoculation. Natural immunity is due to the power of the animal to destroy the bacteria which invade its tissues, either by the agency of the white blood corpuscles which are strong enough to overcome the bacteria and engulf them, or through certain substances in the blood serum which are able to kill the bacteria. The power of the white corpuscles to overcome the bacteria is greatly assisted by substances in the blood serum called *opsonins*, which become attached to the bacteria and cause them to be more easily taken within the white corpuscles; and the *opsonic index* is the ratio between the number of bacteria taken up by the white corpuscles in the normal blood of an animal and the number contained within the white corpuscles in the blood of an infected animal of the same species.

Artificial immunity may be considered under two heads, *active* and *passive*. Active immunity is produced by injecting into an animal non-lethal doses of the living organisms, with their virulence attenuated by various abnormal methods of growing them, or simply in small, non-lethal quantities, or by injecting non-lethal doses of the dead bacteria or of the filtered toxins produced by them in cultures. This gradually produces a resistance to the effects of the bacteria in the animal subjected to the treatment, by the production of more and more resistant substances in the blood. Passive immunity is produced by injecting into an animal the blood serum of another animal which has been rendered immune by the methods described in regard to active immunity, thus carrying to the second animal the resistant substances formed in the blood of the first. The antitoxins, or substances which counteract the bacterial toxins, are believed to be substances which are normally present in the blood, but under the stimulation of the toxins they are produced in increased quantity, and they act directly by combining with the toxins and neutralising them.

Principles of Bacteriology, Abbott; *Structure and Functions of Bacteria*, Fischer; *Manual of Bacteriology*, Muir and Ritchie; *Studies in Immunity*, Ehrlich; *Handbuch der Pathogenen Mikroorganismen*, Kollo and Wassermann.

BACTRIA, ancient district, Central Asia, now forming part of Afghanistan and Asiatic Russia; situated between Amu Daria R. and Hindu-Kush Mts.; said to have been powerful kingdom dating to XI. cent. B.C.; subdued by Persians, subsequently

by Alexander the Great; part of Seleucid empire; independent kingdom under Diodotus I. (III. cent. B.C.).

BACUP (53° 42' N., 2° 12' W.), market town, on Irwell, Lancashire, England; cotton spinning. Pop. (1911) 22,300.

BAD LANDS, waste tracts of deeply eroded plateaus, forming valleys, columns, and peaks, found in Black Hills region of Missouri basin, which early French visitors called *mauvaises terres*.

BADAJOS.—(1) (38° 59' N., 6° 56' W.) frontier province, western Spain; undulating surface; metals, pork; area, 8451 sq. miles. Pop. (1910) 561,900. (2) (38° 53' N., 6° 48' W.) town, on Guadiana, Spain; strong fortress; old cathedral; ruined Moorish castle; surrendered to Soult, 1811; retaken by Wellington, 1812; hats, pottery. Pop. (1910) 33,200.

BADAKSHAN (37° N., 70° 30' E.), territory, part of Afghan Turkestan between Hindu-Kush and Oxus; watered by B. River; capital, Faizabad; produces gold, silver, iron, copper, lead, rubies, emeralds, lapis lazuli, etc.; conquered in turn by Chinese, Sultans of India, Afghans, Uzbeks; whole conquered by Afghans, 1859. **WAKHAN** is dependency, S. of Panj R. People are of Aryan race. Area, 8500 sq. miles. Pop. c. 150,000.

BADALONA (41° 25' N., 2° 12' E.), port, Spain; manufactures sugar, glass. Pop. 19,240.

BADBY, JOHN (d. 1410), Eng. Lollard martyr; burned at Smithfield for repudiating the doctrine of transubstantiation.

BADDELEY, ROBERT (d. 1794), Eng. actor; played chiefly at Drury Lane and Haymarket theatres, where he made a great reputation in low comedy, and was the original Moses in the *School for Scandal*. He bequeathed £3 annually to provide a cake and wine at Drury Lane on Twelfth Night, which custom is still observed. His wife, Sophia B. (1745-86), an actress and singer, was noted for her beauty and loose conduct.

BADEN, grand-duchy, S.W. Germany, between Württemberg and the Rhine. Of surface about five-sixths along the E. is hilly. Odenwald is in N., Schwarzwald or Black Forest in S., and remainder in W. is part of Rhine valley; extreme S.E. drained by Danube; rest lies in Rhine basin, tributaries being Main, Neckar, Murg, Kinzig. Temperature and rainfall vary considerably; mean temperature for Heidelberg and Mannheim, 51° Fahr., rainfall ranges from about 40 in. in N. to nearly 80 in Schwarzwald.

History.—The grand-duchy dates only from time of Napoleon I. In XII. cent. member of house of Zähringen (from Z. in the Breisgau), Hermann I., margrave of Verona, inherited B., and from 1112 his successors called themselves margraves of B., sometimes united under one tenant, but early divided into the over-margrave of B.-B. and lower of B.-Durlach, separate, 1527-1771. B.-B. remained Catholic at Reformation while B.-D. became Protestant; united, 1771, under Karl Friedrich of B.-D. In 1803 margravate was raised to electorate, and in 1806 Karl Friedrich by joining Confederation of Rhine became sovereign prince and assumed title grand-duke; his grandson Karl married Stéphanie de Beauharnais; in 1815 B. entered German Confederation and received liberal constitution, 1818; reforming grand-duke Leopold (1830-52), the *Volksfreund*, introduced Prussian *Zollverein*, 1832; forced to fly by armed risings of 1848-49; reinstated, 1849, by Prussian aid. Religious differences, still unsettled, broke out under his son; Concordat made (1859) with Rome roused strong opposition. B. supported Austria against Prussia, 1850-68, but then left German Confederation and joined Prussia, whom she supported against France, 1870-71.

Government is monarchy; executive in hands of grand-duke, who shares legislative power with *Landtag*, assembly of two houses, of which lower has 73 members elected by people. Upper House has some hereditary members, some who are chosen by grand-duke and some who sit in virtue of their office.

Resources.—Rhine district produces grain, tobacco, hemp, rape, chicory, hops; vines on hills, forests of pine.

sak, beech, birch, ash in Schwarzwald; several districts noted for wine. Minerals include limestone, gypsum, salt, soda; many mineral springs. Manufactures cottons, ribbons, paper, tobacco, beer, clocks, musical instruments, hats, chemicals, etc., all exported. Capital, Karlsruhe. Area, 5823 sq. miles. Pop. (1910) 2,142,833.

BADEN (47° 28' N., 8° 18' E.), town, Switzerland; noted for thermal mineral springs since Roman times; seat of Swiss federal council for three cantons. Pop. 6050.

BADEN-BADEN, or **BADEN** (48° 46' N., 8° 15' E.), beautifully situated watering-place in Baden; famous for mineral springs and baths; known to Romans; visitors annually about four times pop., c. 17,000.

BADEN-BEI-WIEN (48° 1' N., 16° 14' E.), town, Lower Austria; well-known spa, has thermal mineral springs. Pop. 12,447.

BADENI, CASIMIR FELIX, COUNT (1846-1909), Austrian premier (1895-97); roused great opposition from German element in Reichsrath through support of Bohemians and Moravians.

BADENOCH (56° 55' N., 4° 10' W.), mountainous district, S.E. Inverness-shire, Scotland; deer forests.

BADEN-POWELL, LIEUT.-GEN. SIR ROBERT STEPHENSON (1857-), Brit. general; held Mafeking until its relief, 1900, and assisted in capture of Pretoria; estab. Boy Scouts brigades, 1908. The Boy Scouts movement (including 'Sea Scouts') has spread all over the Brit. Empire and U.S.A.; it aims at giving knowledge of art of war and at development of hardihood and manliness in future citizens. A similar association of GIRL GUIDES has been formed.

BADENWEILER (47° 49' N., 7° 24' E.), village, Baden, Germany; mineral springs.

BADGE (M.E. *Bage*), emblem adopted by different families; originated at same time as armorial bearings, to which it does not belong; early example, Fr. *fleur-de-lys* (XII. cent.) of royal family.

BADGER (*Meles*), Musteline Carnivora of N. hemisphere, of nocturnal, solitary habits, living in burrows; badger-drawing was an old Brit. sport, hence *badgering*, term for worrying or teasing. See also WEASEL FAMILY.

BADGHIS (35° 10' N., 62° E.), district, N.W. Afghanistan.

BADHAM, CHARLES (1813-84), Eng. scholar; b. Ludlow; ed. Oxford; subsequently schoolmaster at Louth and Birmingham; from 1866 until his death was prof. of Logic and Classics in Sydney Univ.; was noted for his ripe scholarship, and editions of Euripides, Plato, and other classic authors.

BADIGEON, compound used for filling holes in marble-work.

BADINGUEUX (Fr.), nickname of supporters of Napoleon III., who was styled *Badinguet* after his flight from Ham in clothes of mason of that name.

BADMINTON, a game, named after the seat of the Duke of Beaufort in Gloucestershire, somewhat resembling tennis, played with racquets and a shuttlecock by two players, one on each side, or four players, two on each side, on a court 44 ft. long and 20 ft. broad, with a net stretched transversely across the middle, 30 in. deep, the top of the net being 5 ft. from the ground at the centre. In England the game is usually played in a covered court, which must not be less than 18 ft. in height. The game is for 15 or 21 aces (in ladies' singles 11 aces), and a rubber is the best of three games. (*Laws of Badminton and the Rules of the Badminton Association*, pub. annually.)

BADMINTON (51° 35' N., 2° 17' W.), village and parish, Gloucestershire, England.

BADNUR (21° 52' N., 77° 57' E.), town, Betul, Central Provinces, India.

BADRINATH (30° 44' N., 79° 32' E.), sacred town, United Provinces, India; temple.

BADULLA (7° N., 81° 5' E.), town, Uva, S.E. of Kandy, Ceylon.

BAEDEKER, KARL (1801-59), Ger. guide-book publisher; b. Essen; s. of a printer and bookseller;

acquired a world-wide reputation for his series of travel hand-books, which now number upwards of seventy volumes. Though the name 'Baedeker' has now come to be used as a common noun, it should not be forgotten that the inception of guide-books was due to John Murray, who, in 1836, published the first of its kind, the *Handbook for Holland and North Germany*. B. followed with a similar vol. in 1839, in which he expresses his indebtedness to the Eng. publisher; and for several years following Karl B. assisted in the editing of Murray's guides. The modern editions of B.'s guides are works of wonderful completeness.

BAEL FRUIT (*Aegle marmelos*), or **BENGAL QUINCE**, tree, with aromatic fruit, of W. Africa and tropical Asia; cultivated in India.

BAENA (37° 38' N., 4° 19' W.), town, Cordova, Spain. Pop. 14,539.

BAER, KARL ERNST VON (1792-1876), Ger. biologist; founded the science of comparative embryology; discovered the human ovum and the chorda dorsalis, and investigated the development of vertebrates; also became an authority on Arctic fauna and flora; his discoveries had far-reaching and permanent influence on modern biological science; chief of the Zoological Museum at Königsberg (1817), and librarian of the Academy of Sciences, St. Petersburg, 1834.

BAER, WILLIAM JACOB (1860-), Amer. artist; revised miniature-painting in America, and was first Pres. of the Society of M. P., New York.

BAEYER, JOHANN FRIEDRICH WILHELM ADOLF VON (1835-), Ger. chemist, Prof. of Chem. in Munich, noted for researches in organic chem., especially on indigo.

BAEZA (37° 57' N., 3° 27' W.), town, Jaen, Spain; important Moorish city; leather. Pop. 14,379.

BAFFIN BAY (72° 30' N., 66° W.), large gulf, W. of Greenland; first explored by Baffin, 1616; whales, seals.

BAFFIN LAND (70° N., 70° W.), extensive island, W. of B. Bay; no trees.

BAFFIN, WILLIAM (1584-1622), Eng. navigator; b. London, of lowly parentage; served as pilot in a Greenland voyage, 1612; spent two years in Spitzbergen whale-fishing, 1613-14; went as pilot of the *Discovery* in search of the N.W. Passage for the Muscovy Company, 1615, when he made a survey of Hudson's Strait. In the following year he discovered the bay which has since borne his name. He was killed at the siege of Ormuz, Jan. 23, 1622, when the English were allied with the Persians against the Portuguese. *Voyages*, edit. by Sir C. R. Markham, 1880.

BAGAMOYO (6° 31' S., 38° 50' E.), seaport town, Ger. E. Africa; commercial centre. Pop. 11,000.

BAGASSE (Fr.), remains after pressing sugar-cane; forms fuel.

BAGATELLE, originally meaning (Fr.) a trifle; a game resembling billiards, played on a table about 7 ft. by 1½ ft. or slightly larger, with slate floor covered with cloth, and cushioned at the sides. Nine small ivory balls are used, the object being to put them into nine numbered holes at one end of the table by the aid of a cue.

BAGDAD, BAGHDAD.—(1) (33° 17' N., 44° 28' E.), vilayet, Asiatic Turkey, in valleys of Euphrates and Tigris; area, 42,500 sq. miles. Pop. 600,000. (2) (33° 22' N., 44° 28' E.) town, Asiatic Turkey; capital, vilayet of B., on Tigris; great commercial centre, has large transit trade with Aleppo and Damascus; Bagdad or Euphrates Valley Railway, which is to extend Anatolian line from Konia to Persian Gulf, was completed as far as Bulgurlu, 1904; financed internationally.

B. manufactures leather, silks, cottons; exports wools, carpets, galls, gums, dates, mohair, skins, hides, ore, almonds, pulse, seeds. Town is surrounded by brick and mud wall, and is situated on both sides of river, with bridge of boats connecting the two parts; there is

a citadel commanding river. Little trace remains of former glory except a few ruined mosques, and some ancient tombs. Modern town is very irregular, with narrow unpaved streets, quaint houses, and few important public buildings. There is modern palace; many mosques, both old and modern. People are chiefly Muslims, with admixture of Jews, and there are a few Christians. Administration rests with pasha and council.

From various remains there seems to have been a town on site of B. at very early date. Caliph Al-Mansur founded Arab city here about 763 A.D.; this quickly developed, becoming chief town of caliphate and reaching its greatest glory in times of celebrated Haroun al Raschid in IX. cent., when it was most magnificent city in world. Under later caliphate B. began to decline; taken and sacked by Hulaku in 1258, by Timur the Tartar 150 years later; afterwards saw constant struggle between Shahs and Sultans until its greatness was completely gone; has belonged to Turkey since 1638. Pop. c. 150,000.

BAGÉ (31° 30' S., 54° 15' W.), town, Rio Grande do Sul, Brazil.

BAGEHOT, WALTER (1826-77), Eng. economist; s. of a banker; b. Langport, Somerset; ed. Univ. Coll., London; called to Bar (1852); joined his f. in the banking business of Stuckey & Co.; editor of *The Economist* from 1860 until his death. His notable writings include: *The English Constitution* (1867), *Physics and Politics* (1869), *Lombard Street* (1873), *Literary Studies* (1879), *Economic Studies* (1880), the two latter being pub. after his death. B. undoubtedly exercised considerable influence upon the thought of his time, and several of his works were trans. into a number of foreign languages.

BAGELKHAND, BAGHELKAND (24° N., 82° E.), tract of country, Central India, comprising several Rajput states; area, 11,324 sq. miles. Pop. 1,737,100.

BAGGESEN, JENS IMMANUEL (1764-1826), Dan. poet; b. Korsör, of very poor parents; was self-educated until he managed to gain entrance to Copenhagen Univ. in 1782. His *Comic Tales* (in verse), pub. when he was 21, met with immediate success. He wrote with equal fluency in both Danish and German; his other works include *Alpenkied*, *The Labyrinth*, and *Parthenais*. His later years were clouded with poverty and madness.

BAGHAL (31° 13' N., 77° 1' E.), small hill state, Punjab, India.

BAGHERIA (38° 4' N., 13° 31' E.), town, Palermo, Sicily. Pop. 18,500.

BAGILLT (53° 15' N., 3° 9' W.), town, Flintshire, Wales; coal mines.

BAGIMOND'S ROLL, roll of assessment, drawn up by B. (Boiamund) de Vitia, of tax imposed by Council of Lyons (1274).

BAGIRMI (11° N., 17° E.), state, Central Africa, in valley of river Shari; capital, Chekna; subject to Wadai; contains fertile level plateau; pop. principally negroes; rice, cotton; pastoral Fula and Arabs rear cattle.

BAGLIVI, GEORGES (1669-1706), Ital. physician. **BAGNÈRES-DE-BIGORRE** (43° 6' N., 0° 7' E.), watering-place, Hautes Pyrénées, France; sulphur springs, marble.

BAGNÈRES-DE-LUCHON (42° 46' N., 0° 35' E.), watering-place, Garonne, Pyrenees, France; sulphurous thermal springs. Pop. 7000.

BAGNÈS (Fr. plur., from Ital. *bagno*, first applied to bath in palace at Constantinople, afterwards to prison probably adjoining), Fr. prisons which in 1748 replaced the galleys; abolished 1852 by Napoleon III.

BAGNI (43° 48' N., 10° 24' E.), town, Tuscany, Italy.

BAGNI DI LUCCA (44° 2' N., 10° 35' E.), town, Lucca, Italy; mineral springs. Pop. 13,685.

BAGNO (43° 32' N., 10° 37' E.), town, Pisa, Italy; hot mineral springs. Pop. 20,899.

BAGNO A RIPOLI (43° 46' N., 11° 18' E.), town, Florence, Italy. Pop. 15,936.

BAGNO IN ROMAGNA (43° 50' N., 11° 57' E.), town, Florence, Italy; thermal springs. Pop. 9601.

BAGPIPE, wind instrument, which has been known from a very early period throughout Europe and Asia; was common in Germany and England as early as the XV. cent.; is referred to by Chaucer, Spenser, and Shakespeare; and is still used in Italy, in Southern France, and in Great Britain (Ireland, Scotland, and Northumberland). The Highland b., which is now the most familiar, consists of an airtight leathern bag, a wind-tube for blowing, three wooden pipes called *drones*, and the *chanter*, a pipe with notes, which produces the melody, the compass consisting of nine notes only. In playing, the *drones* point over the left shoulder, the bag is held under the left arm, the blow-pipe is taken between the lips, and the fingers manipulate the notes of the *chanter*. Occasional 'flourishing' or ornamental notes introduced by a player are known as *warblers*. The Irish b., with a much more elaborate *chanter*, is a very sweet-sounding instrument, but is now rarely met with.

BAGRATIDES, Armenian dynasty who ruled Armenia from 885 till overthrow by Turks, XI. cent., and continued in Lesser Armenia till 1375 and in Imeritia, Georgia, till 1810.

BAGRATION, PETER, PRINCE (1765-1812), brilliant Russ. general.

BAGSHOT BEDS, Upper Eocene series of sands and clays containing fossil plants (e.g. *Eucalyptus*, *Platanus*), exposed in Surrey, Hants, Alum Bay (I.O.W.).

BAHADUR SHAH II., last Mogul emperor of Hindustan (1837-57).

BAHÁIS, influential Muhammadan sect in Persia; disciples of Bahá'ullah (d. 1892), who broke away from Bábism (q.v.). The Bible, Koran, and their own books they regard as equally inspired. Buddha, Zoroaster, Christ, Muhammad, and Bahá'ullah were all messengers and manifestations of God. Propagandist work is being actively carried on in Britain and America. The present head of the B. is 'Abbas Efendi, a son of Bahá'ullah.

BAHAMAS, LUCAYOS, chain of coral islands, W. Indies, extending about 600 miles from E. coast of Florida to N. coast of Hayti; belong to Britain; include 29 islands and 660 islets, about 20 being inhabited; area, c. 4400 sq. miles. Rock is porous, retaining moisture, hence soil fertile. B. produce maize, cotton, pine-apples, oranges, lemons, olives, tamarinds, cinnamon, etc.; sponges found in surrounding seas; import textiles, earthenware, glass, foods, etc.; principal exports, sponges, fruits, fibre; administered by gov., executive, and legislative councils and representative assembly; government system of education. Islands were first land seen by Columbus on his voyage of discovery; have belonged without interruption to Britain since 1718. Largest are Andros, Gt. Abaco, Gt. Bahama, and Gt. Inagua islands. Capital is Nassau, New Providence. Pop. (1911) c. 56,000.

BAHAWALPUR, BHAWALPUR (29° 24' N., 71° 47' E.), capital, native state, in Punjab, India, near the Sutlej; level and partly desert; silks, chintzes; area of state, 15,000 sq. miles. Pop. (1911) 780,641.

BAHIA (12° 56' S., 38° 27' W.), state of Brazil, bordering Atlantic; traversed N. and S., by mountain range; principal river, São Francisco; productive soil; diamonds, gold; area, 216,000 sq. miles. Pop. 2,300,000.

BAHIA, or SÃO SALVADOR (12° 56' S., 38° 27' W.), seaport, capital B. state; one of the best harbours east S. America; oldest Brazilian city, founded 1510; seat of R.C. bsp. Pop. 250,000.

BAHIA BLANCA (39° 25' S., 61° 25' W.), city and port, Buenos Aires, Argentine Republic; good harbour. Pop. 50,138.

BAHOUR, district, Fr. India. Pop. 18,850.

BAHR, Arabic geographical term signifying lake or river, e.g. Bahr-el-Yemen, Red Sea.

BÄHR, JOHANN CHRISTIAN FELIX (1798-1872), Ger. classical scholar; chief work, *Geschichte*

der *romischen Literatur*, continued in works on early Christian and Carolingian writers.

BAHRAICH, BHARAICH (27° 35' N., 81° 38' E.), town and district, United Provinces, India; tomb of Masaud, warrior and Mussulman saint, visited by pilgrims. Pop. 24,300.

BAHRĀM, name of five Persian kings of Sassanid dynasty. Bahrām V. (420–39), the 'Wild Ass,' is celebrated in Persian lit. as warrior and hunter.

BAHRDT, KARL FRIEDRICH (1741–93), Ger. theologian; extreme rationalist; forced to abandon Univ. of Giessen; finally retired to Prussia, established secret society, and was imprisoned; author of *True Christian in Solitude and Commentary on Malachi*.

BAHREIN ISLANDS (26° N., 50° 30' E.), group of islands, Persian Gulf, near Arabian coast, governed by Sheikh, under Brit. protection; principal island, B.; capital, Manameh; pearl fishing centre; dates. Pop. c. 100,000.

BAHR-EL-GHAZAL (9° N., 28° E.), river, Sudan; rises in Belg. Congo and, flowing to N.E. through marshy district, unites with White Nile near Sobat; has several feeders, including Bahr-el-Homr, Lol, Jur, Tonj; sometimes obstructed by sudd. Another river of same name flows from Lake Chad to Bodele region, where it ends in swampy country.

BAIE (40° 48' N., 14° 4' E.), town, Campania, Italy, W. of Naples; favourite watering-place of ancient Romans; famous for its warm mineral springs; remains of villas and baths; in B. Triumvirate was formed by Cæsar, Pompey, and Crassus, 60 a.c.

BAIBURT (40° 14' N., 40° 4' E.), town, on Churuk, Asiatic Turkey; carpets. Pop. c. 10,000.

BAIF, JEAN ANTOINE DE (1532–89), Fr. poet; intimate friend of Ronsard; was patronised by Charles IX. and Henry III.; wrote much original verse, paraphrased some of the principal Gk. and Latin lyric poets, and introduced changes into Fr. versification; member of Pléiade (*q.v.*).

BAIKAL (54° N., 108° 30' E.), lake, E. Siberia, surrounded by mountains rising to height of 4500 to 5500 ft. above sea-level; length, 370 miles, breadth, 50; surface, about 1380 ft. above sea-level; average depth, c. 900 ft.; frozen, Dec. to May; crossed by steamers in connection with Siberian railway; salmon, sturgeon, and seal fisheries in N. end; fresh water; receives many streams.

BAIKIE, WILLIAM BALFOUR (1824–04), Brit. traveller, scientist, and author; surgeon and naturalist to Niger expedition, 1854; opened up Niger for England and pub. books on native languages.

BAIL, the setting free of an arrested person who procures surety, or b., on the part of one or more persons who are responsible for his or her re-appearance to answer a charge at a fixed time and place. The power of admitting to b. is, in ordinary cases, at the direction of the magistrate.

BAILEN (38° 5' N., 3° 45' W.), town, Spain; French surrendered to Spaniards, 1808. Pop. 7500.

BAILEY, GAMALIEL (1807–59), Amer. journalist; was a strong abolitionist; became editor of the *National Era* (Washington, D.C.), in which Mrs. Stowe's *Uncle Tom's Cabin* first appeared (1851–52).

BAILEY, NATHAN (d. 1742), Eng. lexicographer; was a Stepney schoolmaster and Seventh-day Baptist; pub. *Dictionarium Britannicum, or Universal Etymological English Dictionary* (1721), which had a wide sale and was frequently enlarged and improved. It served as the foundation of Dr. Johnson's later work, and was used by Chatterton in his composition of the 'Rowley Poems.'

BAILEY, OLD, the Central Criminal Court, London.

BAILEY, PHILIP JAMES (1816–1902), Eng. poet; b. Nottingham, where his f. was a newspaper proprietor; his fame depends entirely upon his long poem, *Festus*, pub. anonymously (1839), which had a very extensive sale both in England and America; member of Spasmodic School (*q.v.*).

BAILEY, SAMUEL (1791–1870), Eng. philosophical writer; pub. *Essays on the Formation and Publication of Opinions* (1821), *Essays on the Pursuit of Truth* (1829), *Money and its Vicissitudes, Theory of Reasoning*, etc.

BAILIE, Scot. municipal officer who sits as police-court magistrate, approximating to the Eng. alderman, but whose office is elective and lasts only for a term of three years.

BAILIFF.—(1) Officer app. by a peer or other landed proprietor to manage his estates, collect rents, etc. (2) A sheriff's officer app. to summon Juries, collect fines, etc. (3) County Court b., vulgarly called 'bum-bailiff,' serving under the high-bailiff, who is responsible for the serving and execution of distress warrants.

BAILLET, ADRIEN (1649–1708), Fr. scholar; pub. *Vie de Descartes* (1691), *Histoire de Hollande* (1693), *Les Vies des Saints* (1701), and numerous other hist. and antiquarian works.

BAILLEUL.—(1) (50° 47' N., 2° 43' E.) town, Nord, France. Pop. 13,530. (2) (52° 14' N., 3° 18' E.) town, Belgium.

BAILLIE, LADY GRIZEL (1605–1746), Scot. poetess; dau. of Sir Patrick Home (afterwards Earl of Marchmont); m. George Baillie, s. of the Scot. patriot, Robert B. of Jerviswood; she left numerous songs in MS., besides those pub. during her lifetime, her best-known lyric being *Werena my heart licht I wad dee*.

BAILLIE, JOANNA (1762–1851), Scot. dramatist and poet; dau. of the minister of Bothwell, in Lanarkshire; began to pub. verse at an early age, but is chiefly remembered for her *Plays on the Passions* (1798), which was followed by several other vol's of a like character. Her dramas were little suited for stage representation.

BAILLIE, ROBERT (1599–62), Scot. theologian; member of Glasgow Assembly (1638); chaplain in Leslie's Scot. army; prof. of Divinity, Glasgow (1642); one of the commissioners sent to Holland (1649) to invite Charles II. to Scotland. His *Letters and Journals* are of considerable hist. value.

BAILLIE, ROBERT, OF JERVISWOOD (d. 1684), Eng. conspirator, hanged for implication in Rye House Plot.

BAILLOT, PIERRE MARIE FRANÇOIS DE SALES (1771–1842), famous Fr. violinist.

BAILLY, JEAN SYLVAIN (1736–93), Fr. astronomer; observed Halley's comet, 1769; took part in Revolution; guillotined in Paris.

BAILY, EDWARD HODGES (1788–1867), Eng. sculptor; b. Bristol; s. of a naval wood-carver; entered R.A. Schools (1809); gold medal (1811); R.A. (1821); carved some of the bas-reliefs on the Marble Arch, and was responsible for the Nelson Statue in Trafalgar Square.

BAILY, FRANCIS (1774–1844), Eng. astronomer, pioneer of modern solar eclipse expeditions; superintended preparation of star catalogues; one of leading founders of R. Astronomical Soc.; observed and described the discontinuous beadlike effect occurring in the visible crescent of the sun at times of eclipse, called *Baily's Beads*.

BAILY, WILLIAM HELLIER (1819–88), Eng. palæontologist; assisted in Eng. and Irish Geological Survey; author of works on palæontology; nephew of E. H. Baily.

BAIN, ALEXANDER (1818–1903), Scot. philosopher; b. Aberdeen; was a weaver in early life, later entered Marischal Coll.; prof. at Aberdeen and Glasgow; subsequently moved to London, and pub. *The Senses and the Intellect* (1855), *The Emotions and the Will* (1859); prof. of Logic and English in the Univ. of Aberdeen from 1860–80. His later publications include *Higher English Grammar* (1863), *Manual of Rhetoric* (1866), *Manual of Mental and Moral Science* (1868). His psychology was based wholly upon mental physiology, and was strongly associationist in tendency. He lived on intimate terms with J. S. Mill and Grote, and founded *Mind*, a philosophical journal.

BAIN, ANDREW GEDDES (1797-1864), Scot. geologist; emigrated to S. Africa; started geological map of Cape Colony; discovered *Dicynodon* and other fossil reptiles in Karroo Beds.

BAINBRIDGE, JOHN (1582-1643), Eng. astronomer; Savilian prof. of Astron., Oxford.

BAINBRIDGE, WILLIAM (1774-1833), Amer. commodore; fought against England, then Barbary Pirates; improved organisation of navy.

BAINDIR (38° 3' N., 27° 40' W.), town, Asiatic Turkey; figs.

BAINES, EDWARD (1774-1848), Eng. newspaper editor and proprietor and politician; bought *Leeds Mercury*; compiled directories for Yorks and Lancs. M.P. for Leeds, 1834-41.

BAIRAKTAR, MUSTAFA, BAIRAK-DAR (1755-1808), Turk. grand vizier; avenged murder of Selim III. on janissaries, 1808, and assisted Mahmud II. to obtain sovereignty; besieged by janissaries and slew their candidate and himself.

BAIRAM, name of two Muhammadan festivals; first, at beginning of X. month (3 days long), followed after 70 days by second, which commemorates Abraham's offering up of Isaac.

BAIRD, SIR DAVID (1757-1829), Brit. soldier; commanded at capture of Cape Colony, 1806; second in command under Moore at Corunna, where he lost an arm.

BAIRD, SPENCER FULLERTON (1823-87), Amer. naturalist; studied chem., physiology, math's, and especially ornithology and zool.

BAIREUTH, see **BAYREUTH**.

BAIT-BUG (*Hippa talpoides*), small Amer. crustacean of burrowing habits.

BAIZE, stout fabric, generally green; used extensively as cover for card- and billiard-tables.

BAJAUR (35° N., 71° 30' E.), small protected district, borders of Brit. India and Afghanistan; fertile plain, encircled by forest-covered mountains; iron ore; area, c. 370,000 sq. miles. Pop. c. 120,000. Capital, B. Pop. c. 5000.

BAJAZET I., BAYAZID (1347-1403), great Ottoman sovereign and warrior, who obtained title of Sultan from the Caliph.

BAJAZET II., BAYAZID (1447-1512), Sultan of Turkey; succ. his f., Muhammad II., in 1481. The power of Turkey greatly diminished under his rule.

BAJZA, JOSEPH (1804-58), Hungarian author, editor, etc.; wrote notable verse and developed national literature.

BAKHISERAI (44° 44' N., 33° 53' E.), town, Crimea, Russia; was capital of Tartar Khans; morocco. Pop. 15,000.

BAKE, JAN (1787-1864), Dutch critic and philologist; prof. of Greek and Latin at Leiden Univ.; pub. *Critica Nova* (1825-31), *Scholica Hypomnemata* (1837-62), also edit. some of the works of Cicero and Longinus.

BAKEL.—(1) (51° 31' N., 5° 45' E.) town, Brabant, Holland. (2) (14° 57' N., 12° 19' E.) town, Sudan. (3) (15° 5' N., 12° 40' W.) fortified town, Senegal, W. Africa.

BAKER CITY (45° N., 117° 30' W.), town, Oregon, U.S.A.; gold and silver mines. Pop. 6742.

BAKER ISLANDS, islands on equator, Pacific Ocean; under Brit. protection.

BAKER, MOUNT (48° 45' N., 121° 42' W.), mountain, Washington, U.S.A.; 10,827 ft.

BAKER, SIR BENJAMIN (1840-1907), Eng. engineer; associated with Sir John Fowler; designed metropolitan and other London underground railways; designed the special vessel for conveying Cleopatra's Needle to London; his best-known work is the Forth Bridge; consulting engineer for Assuan dam; author of many engineering papers.

BAKER, HENRY (1698-1774), Eng. naturalist; m. dau. of Daniel Defoe; Copley gold medallist for microscopical researches on crystallisation, and founder of Bakerian Lecture of Royal Soc.

BAKER, SIR RICHARD (d. 1645), Eng. scholar; was an Oxfordshire squire and high sheriff of the county; knighted by James I.; ruined by aiding his wife's relations, and spent his last ten years in Fleet Prison, where he wrote *Chronicle of the Kings of England* and other hist. and theological works.

BAKER, SIR SAMUEL WHITE (1821-93), Brit. explorer, sportsman, and writer of books of travel; founded Brit. colony at Newera Eliya, Ceylon, 1848; built Black Sea Railway, 1859-60; explored sources of Nile, discovering Lake Albert Nyanza, 1861-64.

BAKER, THOMAS (1656-1740), Eng. clergyman and antiquary; Fellow of St. John's Coll., Cambridge, and rector of Long-Newton; collected upwards of 40 valuable MSS. relating to Cambridge Univ.

BAKER, VALENTINE, 'BAKER PASHA' (1827-87), Brit. soldier; brilliant cavalry officer, bro. of Sir Samuel B. (q.v.); distinguished himself in Crimean War and afterwards in service of Turks.

BAKEWELL (53° 14' N., 1° 42' W.), town, on Derwent, Derbyshire, England; mineral springs.

BAKEWELL, ROBERT (1725-96), Eng. agriculturist and breeder; best known for improving the Leicestershire breed of sheep and Dishley cattle.

BAKEWELL, ROBERT (1768-1843), Eng. geologist; one of the earliest teachers and writers on geology.

BAKHMUT (48° 30' N., 37° 35' E.), town, Ekaterinoslav, Russia; salt. Pop. 20,000.

BAKHTEGAN (29° 40' N., 54° E.), saline lake, Persia.

BAKING, see **COOKERY**, **BREAD**.

BAKÓCZ, TAMAS (1442-1521), Hungarian cardinal and statesman; established Austro-Hungarian alliance.

BAKONY WALD (47° 25' N., 18° 5' E.), forested district, Hungary, between Danube and Lake Balaton.

BAKSHISH (Pers.), term used in Egypt and parts of East for 'tip' or gratuity.

BAKU.—(1) (40° 21' N., 49° 51' E.) government, Transcaucasia, Russia, W. of Caspian Sea; area, 15,061 sq. miles. Pop. (1910) 1,013,900. (2) (40° 35' N., 49° 55' E.) fortified seaport town, capital of B. government; Russ. naval station; great petroleum district; ancient temples of fire-worshippers. Pop. 177,777.

BAKUNIN, MIKHAIL (1814-76), Russ. revolutionary and political writer; organised anarchical movements and democratic associations all over Europe; frequently extradited.

BALA (52° 53' N., 3° 35' W.), market town, Merionethshire, Wales; flannel. **Bala Series**, or **CARADOC GROUP**, consists of sandstones, shales, and fossiliferous (Brachiopods, trilobites, and graptolites) limestones, forming upper Ordovician; well developed near Bala.

BALAAM, a Gentile prophet whom Balak, king of Moab, sent for to curse Israelites; God, in a dream, forbade him to do so (*Numbers* 22-24).

BALADHURT (d. 892), important historian of Persia; so known from poison by which he died.

BALENA, see **WHALE**.

BALAFRE (Fr.), person who has scar of wound (*balafre*) on face.

BALAGHAT (21° 20' N., 80° 15' E.), plateau, Nagpur, Central Provinces, India; between E. and W. Ghats; area of dist., 3132 sq. miles. Pop. 325,371.

BALAGUER, VICTOR (1824-1901), Span. author and politician; his first play (*Pepin el Jorobado*) was produced at Barcelona when he was 14, and his second, *Don Enrique el Dado*, when 19; he was Liberal leader (1843-68), editor, and proprietor of the newspaper, *El Consellor*; was subsequently minister of finance, vice-pres. of Congress, and senator.

BALAKIREV, MILI ALEKSEIVICH (1836-), Russ. composer; well known as a conductor in his native country; composer of symphonies, overtures, songs, etc., some of which have been given at Eng. musical festivals.

BALAKLAVA (44° 38' N., 33° 36' E.), Sahing

village, Crimea, Russia; port of Lemnigians at which Ulysses is said to have touched; Brit. headquarters during Crimean war; indecisive battle (Oct. 25, 1854), in which Light Brigade, Heavy Brigade, and Highland Brigade all distinguished themselves.

BALALAIKA, a Slav stringed instrument, very popular as an accompaniment to dances and folk-songs amongst the Russ. peasantry; has triangular sound-board, fitted with a long wooden neck, strung with from two to four strings, which are plucked with the fingers.

BALANCE, appliance for comparing weights and forces. See **WEIGHING MACHINES**.

BALANCE, THE, see **LIBRA**.

BALANCE OF POWER, political term signifying international interest in keeping one state from preponderating. It became axiom of foreign politics in XVII. cent.

BALANOGLOSSUS, a primitive chordate animal (see **HEMICHORDATA**), worm-like in habits and appearance, and found burrowing in sand or mud in shallow sea water. The body is in three divisions: proboscis, containing the notochord; ring-like collar, in front of which the mouth lies; and long trunk, with segmentation only in the respiratory and genital organs. Within it are many gill-slits which open to the exterior by gill-pores. The free pelagic larva is known as a Tornaria.

BALAPUR (20° 40' N., 76° 48' E.), town, Berar, India. Pop. 10,486.

BALARD, ANTOINE JÉRÔME (1802-76), Fr. chemist; discovered Bromine; numerous researches in pure and applied chem.

BALASINOR (22° 59' N., 73° 16' E.), dependency of Guzerat, India. Pop. 32,618. Capital, B. Pop. 8,530.

BALASORE (21° 30' N., 87° E.), district and seaport, Orissa division, Bihar and Orissa, India; early Brit. settlement (1642); produces rice; area, 2085 sq. miles. Pop. 1,071,197.

BALASSA, BALINT (1551-94), Magyar lyric poet; was author of hymns, battle-songs, and love lyrics, all marked by striking originality; killed at the siege of Esztergom, during the Turkish War.

BALATA GUM, juice obtained from b. sapotaceous tree of tropical America; it is used in place of india-rubber and also makes chicle gum.

BALATON (46° 45' N., 17° 45' E.), largest lake, Hungary; c. 50 by 10 miles.

BALAYAN (13° 51' N., 120° 42' E.), seaport and bay, Luzon, Philippine Islands. Pop. 8,500.

BALBI, ADRIANO (1782-1848), Ital. geographer, whose writings were noted for accuracy. S., **EUGENIO B.** (1812-84), was prof. and geog. writer.

BALBI, GASPARO (fl. XVI. cent.), Ital. traveller; made explorations in India and wrote *Viaggio nelle Indie Orientali* (1590).

BALBO, CESARE, COUNT (1789-1853), Ital. author and statesman; b. Turin; served in various capacities under Napoleon, after whose fall he devoted his energies entirely to his native country. He had no expectation of a truly united Italy, but speculated upon a confederation of states under the papal supremacy; pub. *Vita di Dante* (1839), and several works advocating Ital. independence.

BALBOA, VASCO NUÑEZ DE (1475-1517), Span. explorer; of noble birth; began life as an adventurer, and developed into an able general and administrator; founded a colony on the Darien Isthmus; discovered the Pacific (1513) and received from King Ferdinand title of 'Admiral of the South Sea.' His brilliant successes, however, aroused the jealousy of Don Pedro Arias de Avila, the new gov. of the Darien colony, who put forward a false charge against him and secured his execution.

BALBRIGGAN (53° 37' N., 6° 12' W.), seaport and market town, County Dublin, Ireland; hosiery.

BALBUS (meaning 'Stammerer') was the surname of several Roman families. The best-known B. was Lucius Cornelius Balbus, friend, adviser, and sometime secretary to Caesar. He was a native of Gades (Cadiz); became a Roman citizen, and after

Caesar's death rose to be (40 B.C.)—the first alien—consul.

BALCARRES, EARLDOM OF.—David Lindsay, grandson of David, 9th Earl of Crawford (q.v.) and 2nd s. of John Lord Menmuir, was cr. Lord Lindsay of B. (1633); his s. Alexander was in 1651 cr. Earl of B. by Charles II. and left a s., Colin, a prominent Jacobite, but finally pardoned. The 6th earl, Alexander, succ. in 1808, under the patent of 1642, to the earldom of Crawford, the earldom of Lindsay (q.v.) being then separated from it. See **CRAWFORD**.

BALCONY (Ital. *balcone*, from O.H.G. *balcho*, beam), platform projecting from wall of a building inside or outside, and enclosed by parapet; the outside b., great feature of Renaissance architecture, is attached to the window; the inside runs round almost entire wall as in theatre or concert-hall; usually supported by consoles, but may have invisible iron supports.

BALDACHIN(O) (Ital. *baldachino*), canopy used in R.C. Church to carry over priest in procession, or stationed over altar or pulpit; made later of architectural materials.

BALDER, BALDR, BALDUR, Teutonic god of light and justice; in the Edda, son of Odin and Freya; everything in creation but mistletoe took oath not to injure him; slain by mistletoe-shaft through cunning of Loki; in the Ragnaravk (*Götterdämmerung*) returned to Asgard; different version preserved by Saxo Grammaticus.

BALDNESS, loss of hair, is due to follicles losing productive power. Causes may be: wearing of a 'bowler' hat, which by pressure lessens flow of blood to head; excessive perspiring about head (cf. liability of Europeans to b. in tropics); excess of dandruff. Treatment is mostly preventive; dandruff is removed by washes, e.g. spirit of soap, bay-rum, perchloride of mercury; in the country no hat should be worn; hard brushes irritate the scalp and produce dandruff. *Alopecia areata*, patchy b., occurs in animals.

BALDUNG, HANS, HANS GRÜN (1476-1545), Ger. artist; a friend of Dürer; his 'Crucifixion,' a masterpiece, is in Freiburg Cathedral.

BALDWIN I. (d. 1118), king of Jerusalem; 2nd s. of Eustace II. of Boulogne; went on First Crusade, 1096; established Christian principality of Edessa, 1098 (which lasted 47 years); succ. his bro. Godfrey de Bouillon as king of Jerusalem, 1100.

BALDWIN II. (d. 1131), king of Jerusalem; e. s. of Hugh, Count of Bethel; succ. his cousin, B. I., as Count of Edessa, 1100, and as king of Jerusalem, 1118; relieved Antioch (1119), besieged by Saracens; taken prisoner (1123). He was ransomed (1124) and extended his kingdom by continual wars. At his death it included all Syria but the territories of Aleppo, Damascus, Emesa, and Hamaah. The religious Orders of the Knights of the Temple and Hospital of St. John of Jerusalem date from his reign, he granting them their places of abode and obtaining papal confirmation. His character was pious and ascetic.

BALDWIN IV., king of Jerusalem (1174-83). The weakness of his rule prepared way for Saladin's conquests.

BALDWIN I. (d. 1205), emperor of Rumania (1204); as Count of Flanders and Hainault was leader in Fourth Crusade by which Constantinople was captured and Latin Empire of Rumania formed.

BALDWIN II. (1217-73), last Frankish emperor of Rumania; s. of Pierre de Courtenay; succ. elder bro. Robert as emperor, 1228. Michael Palaeologus drove B. from Constantinople, 1261.

BALDWIN (d. 1191), abp. of Canterbury; d. during siege of Acre in Third Crusade.

BALDWIN, JAMES MARK (1861-), Amer. philosopher; held professorships at Toronto, Princeton, and Johns Hopkins Univ's; founded *Psychological Review*; pub. *Handbook of Psychology* (1890), *Elements of Psychology* (1893), *Story of the Mind* (1898), etc.

BALDWIN, ROBERT (1804-58), Canadian states-

man; advocated home rule; became solicitor-general, 1840, premier and attorney-general of Upper Canada, 1842.

BALE, see **BASEL**.

BALE, JOHN (1495-1563), Eng. author and bp. of Ossory; b. Cove, near Dunwich, Suffolk; wrote plays and pamphlets against R.C. party, 1538 onwards. He fled to Germany on the fall of Thomas Cromwell; returned under Edward VI., and was made bp., 1552; exiled, 1553-58. His history of Eng. lit. contains valuable information; and his play, *Kynge Johan*, has been printed by Camden Society.

BALEARIC ISLANDS (39° 30' N., 3° E.), islands, off Span. coast, Mediterranean; belonged in turn to Carthaginians, Romans, Vandals, Moors, Aragonese; independent kingdom, 1232-1349, and subsequently united to Spain; famed for slingers in antiquity; include Majorca, Minorca, Iviza, Formentera, and eleven small islands; area, c. 1930 sq. miles; largest towns, Palma, Manacor, Port Mahon; fine climate; produce fruit, wine, oil, grain; export fish. Pop. (1910) 325,703.

BALES, PETER (1547-1610), Eng. calligraphist; pub. *The Writing Schoolemaster* (1590), which included what he termed the *Arts of Brachygraphie*, the earliest Eng. attempt at a system of shorthand.

BALFE, MICHAEL WILLIAM (1808-70), Irish composer and vocalist; s. of dancing master; b. Dublin; for many years operatic singer in Italy and England; composed many operas in English, French, and Italian with remarkable success, of which the best known in Britain is his *Bohemian Girl*; retired (1864) to take up farming.

BALFOUR, ARTHUR JAMES (1848-), Brit. statesman and author; eldest s. of James Maitland Balfour, of Whittingehame, Haddingtonshire, and Lady Blanche Cecil, dau. of 2nd Marquis of Salisbury; Conservative member for Hertford (1874), and became private sec. (1878) to Lord Salisbury, then foreign minister; a member of the 'Fourth Party'; Pres. of Local Government Board (1885-86); Sec. for Scotland, with seat in Cabinet (1886-87); Chief Sec. for Ireland (1887-91); carried *Crimes Act* through Parliament and set up Congested District Boards; app. First Lord of Treasury and leader of House of Commons, 1891-1902. On retirement of Lord Salisbury (1902) he became Prime Minister; passed *Education Act*, *Irish Land Purchase Act*, *Licensing Act*, *Scottish Churches Act*, *Unemployed Act*, and *Aliens Act*; instituted the Army Council and Imperial Defence Committee; cemented the *Entente Cordiale* with France. His undecided attitude towards Mr. Chamberlain's tariff proposals contributed to the Unionist crisis, and ultimate overwhelming defeat in 1906, after his resignation of office in Dec. 1905; but soon regained his prestige as most brilliant parliamentarian of his time. He resigned Opposition leadership in Nov. 1911, being succeeded by Mr. Bonar Law. He is a metaphysician of note, and has written *A Defence of Philosophic Doubt* (1879) and *The Foundations of Belief* (1895). In other circles he is known as an accomplished musician and as a keen golfer; see Alderson's *A. J. B.: the Man and his Work* (1903), and Short's *A. J. B. as Philosopher and Thinker* (1912).

BALFOUR, FRANCIS MAITLAND (1851-82), Scot. biologist, younger bro. of A. J. Balfour; brilliant morphologist at Cambridge Univ.; author of widely recognised treatise on *Comparative Embryology*.

BALFOUR, SIR JAMES, Bart. (1600-57), Scot. antiquary; contributed to Dugdale's *Monasticon*; was knighted and made baronet by Charles I., and also Lyon King-at-Arms, from which office he was dismissed by Cromwell. His *Annales of Scotland* (from MSS. in Advocates' library, Edinburgh) were pub. 1824-25.

BALFOUR, SIR JAMES (d. 1583), Scot. Lord Pres. of the Court of Session; was deeply implicated in the murder of Darnley, is said to have drawn up the marriage-contract between Mary and Bothwell, and

afterwards betrayed the Queen to her enemies. He was held to be the greatest lawyer of his day, and was perhaps one of the most infamous characters in Scot. history.

BALFOUR, JOHN HUTTON (1808-84), Royal botanist for Scotland; prof. of Botany at Glasgow and Edinburgh successively.

BALFOUR OF BURLEIGH, BARONY OF.—Sir Michael B., ancestor of present Lord B., created Lord B., 1607, was descendant of Sir John B., kt. of Balgarvie, who received Burleigh, 1445-46; his dau. and heir, Margaret, m., 1606, Robert Arnot, who took name B. Their descendant, Robert, 5th lord, was sentenced to death for murder, 1709, but escaped in his sister's dress, aided Pretender, was attainted, 1715, and d. unmarried, 1757. His nephew, Robert Bruce, Lord Kennet, was great-grandfather of Lord B. of B. (1849-), Brit. (Conservative Free Trader) statesman.

BALFRUSH, see **BARFURUSH**.

BALI, LITTLE JAVA (8° 30' S., 115° E.), island, Lesser Sunda group, E. of Java; mountainous and volcanic in centre; loftiest peak Gunung Agung, 10,500 ft.; forms, with Lombok (separated by Lombok Strait), Dutch residency; capital, Buleleng; fertile, well cultivated; rice, cotton, coffee. Area, 2300 miles. Pop. 750,000.

BALIKESRI (39° 35' N., 27° 50' E.), town, Turk. Asia Minor; great annual market in August. Pop. c. 15,000.

BALIEL, Scot. family named from their fee of Bailioul, Normandy; Guy came to England with Conqueror; Bernard (Barnard) built Barnard Castle, Durham, early in XII. cent., and fought at Battle of the Standard, 1138; his descendant, John, m. Devorgilla (who founded B. College, Oxford), descendant of David I. of Scotland, and was f. of King John B. (1292-96), f. of Edward B., king 1332-38, who lost favour in Scotland through subservience to Eng. kings; entire family seems to have died out XIV. cent.

BALISTIDE, see **TRIGGER-FISHES**.

BALIUG (14° 55' N., 120° 50' E.), town, Luzon, Philippine Islands; silk. Pop. 14,000.

BALKAN PENINSULA (36° to 48° N., 16° to 29° 40' E.), easterly peninsula, S. Europe; bounded N. by Hungary, Russia, Moldavia; S. by Mediterranean, E. by Black Sea, Sea of Marmora, and Aegean Sea; W. by Ionian and Adriatic Seas; comprises Rumania, Servia, Montenegro, Bulgaria, with E. Rumelia, Turkey, Greece, Dalmatia, and Bosnia—Herzegovina; surface mountainous; area, c. 180,000 sq. miles. Principal rivers are Danube and Maritza, entering Black Sea and Aegean Sea respectively; chief lakes, Scutari and Ochrida. Whole peninsula was under sway of Turks from XV. to XIX. cent., when it began to break up; Greece obtained her independence in 1836; in 1878, by Berlin Treaty, Servia and Rumania also obtained complete independence, the administration of Bosnia and Herzegovina was handed over to Austria-Hungary, and the principalities of Montenegro and Bulgaria were established; in 1886 E. Rumelia was annexed by Bulgaria, and in 1908 Bulgaria was proclaimed an independent kingdom. Pop. is very mixed; consequent hostility of creeds led to incessant unrest, and was prime cause of the international problem known as the Eastern Question, which culminated, 1912, in the Turko-Balkan War (*q.v.*). Pop. c. 18,000,000.

The Balkan Question, edit. L. Villari (London, 1905); 'Odysseus,' *Turkey in Europe* (London, 1900).

BALKANS, THE, term applied to whole mountain range of Balkan Peninsula, but specifically to range which is an immediate continuation of Carpathians, beginning S. of the Iron Gates of the Danube and running E. to Black Sea; other ranges are the Pindus, in Turkey and Greece; the Central Balkans, which form a long and almost uniform ridge running east (highest peak, Yumrukchal, 7790 ft.); the Anti-Balkans (with Mt. Vitosha, 7515 ft.); in the Thracio-Macedonian region is the mountainous district of the Rhodope (highest peaks, Rilodagh and Muss-Alla, c. 10,000 ft.); the Dinaric Alps occupy west of the

peninsula, and run parallel to coast from Dalmatia to Greece (highest peak, Mt. Dinara, 6000 ft.).

BALKASH, BALKHASH (46° 30' N., 75° 30' E.), salt-water lake, Asiatic Turkey; about 300 miles long and 50 miles wide.

BALKH (36° 45' N., 66° 48' E.), city, on river B., Afghanistan; in ancient times, as BACTRA, a flourishing trade centre; now extensive ruins, modern town occupying only small portion of original city; associated with Zoroaster; destroyed by Jenghiz Khan, 1220.

BALL, a spherical or ovoid body of various substances, usually smooth, used in different games or as a missile. B. games have been played from very early times, and were very popular among the ancient Greeks and Romans. See BASE-BALL, CRICKET, GOLF, FOOTBALL, TENNIS, etc., for games in which balls are employed.

BALL, SIR ALEXANDER JOHN, Bart. (1759-1809), Eng. rear-admiral; served under Rodney and Nelson; commanded the *Alexander* at *Battle of the Nile*; blockaded Malta for two years, and eventually became gov. there; frequently mentioned in Nelson's despatches.

BALL, JOHN (d. 1381), Eng. religious agitator; described by Froissart as the 'mad priest of Kent'; his Socialist opinions brought him into conflict with the religious authorities, by whom he was cast into prison at Maidstone, but was released by the Kentish rebels, only to be captured again at Coventry, where he was executed. He may be regarded as the earliest Eng. Socialist, and has been made the subject of a study by William Morris.

BALL, JOHN (1585-1640), Eng. Puritan preacher; ed. St. Mary's Hall, Oxford; was for some time a tutor in Cheshire, afterwards holding a curacy at Whitmore (Staff.), of which he was deprived because of his opinions. He pub. *Treatise of Faith* (1632), *A Short Catechism* (many editions), and other works of the kind.

BALL, JOHN (1818-89), Irish politician and naturalist; Liberal M.P. for County Carlow; Colonial Under-Sec., 1885-1887; 1st pres. Alpine Club.

BALL, SIR ROBERT STAWELL (1840-), Eng. astronomer; Lowndean prof. of Astronomy and Geometry, Cambridge, and author of popular astronomical works.

BALL, THOMAS (1819-1911), Amer. sculptor; executed statues of Washington at Boston, Daniel Webster at New York, Edwin Forrest as 'Coriolanus' at Philadelphia, and many others which have brought him considerable fame.

BALLACHULISH (56° 42' N., 5° 11' W.), village, Argyll, Scotland; slate quarries.

BALLAD, originally a song accompanying a dance (from O. Fr. *baller*, to dance), now used in reference to a narrative poem in simple rhymed metre, most commonly in eight- and six-syllable measure, as thus:—

'John Gilpin was a citizen
Of famous London town.'

B's and folk-songs form part of the lit. of all European countries, and often the same story will be found in various languages. Some of the most beautiful of Eng. and Scot. traditional ballads are of very early date, and have undergone a process of alteration at the hands of many generations of minstrels. Bp. Percy and Sir Walter Scott did much to preserve old ballad lit. Percy's *Reliques* appeared in 1765, and the first vol. of Scott's *Border Minstrelsy* in 1802.

BALLADE, Old Fr. form of verse consisting of three stanzas and an envoi, and containing not more than three or four rhymes. It came into vogue during reign of Charles V., and was very successfully employed at different periods by Alain Chartier, Henry Baude, François Villon, Clément Marot, and Théodore de Banville. The *ballade* form has been used in England by Chaucer, Gower, Lydgate, and amongst later writers by Swinburne, Austin Dobson, and Andrew Lang.

BALLANCE, JOHN (1839-93), New Zealand statesman; b. Ulster; worked in ironmongery business at Belfast and Birmingham, afterwards emigrating to New Zealand, where he became a newspaper proprietor,

entered Parliament, and became Premier (1891). He instituted the system of small farm-holdings, with Government aid, which has worked very successfully.

BALLANCHE, PIERRE SIMON (1776-1847), Fr. philosopher; b. Lyons; attempted to reconcile theocratic and rationalist schools.

BALLANTINE, JAMES (1808-77), Scot. artist and author; did much for modern art of staining glass; carried out staining of windows of House of Lords.

BALLANTINE, WILLIAM (1812-87), Eng. serjeant-at-law; famous for prosecution of Franz Müller (1864), and his defence of the Tichborne claimant (1871). Was a conspicuous figure in the literary and theatrical circles of his day.

BALLANTRAE (55° 6' N., 5° W.), fishing village, Ayrshire, Scotland.

BALLANTYNE, JAMES (1772-1833), Scot. publisher; produced Scott's *Border Minstrelsy*, 1802; removed to Edinburgh, and with his bro. JOHN (1774-1821), established firm of B. & Co., in which Scott had half the shares; final bankruptcy, 1826.

BALLANTYNE, ROBERT MICHAEL (1825-94), Scot. novelist; b. Edinburgh; six years in service of Hudson Bay Company; on his return pub. *Hudson's Bay, or Life in the Wilds of North America*; entered Constable's publishing firm, but in 1856 adopted lit. as profession, and produced about 80 books for boys.

BALLARAT, and **BALLARAT EAST** (37° 34' S., 143° 53' E.), city, Victoria, Australia, next in importance to Melbourne; intersected by Yarrowee Creek; lies in centre of one of the richest gold-fields in the world; largest nugget ever found (the 'Welcome') was found at B.; district suitable for sheep-breeding; industries, gold-mining, iron-founding, brewing; railway centre. Pop. (1910) 44,000.

BALLAST, heavy material placed in hold of ship for stability; sand carried in balloon, and thrown out to ensure rising; gravel on slag bed for railway track.

BALLATER (57° 3' N., 3° 3' W.), village, Aberdeenshire, Scotland; mineral springs of Pannanich.

BALLENSTEDT (61° 43' N., 11° 13' E.), town, duchy Anhalt, Germany; iron ore. Pop. 5696.

BALLET (Fr. *ballet*, Ital. *balletto*, to dance), theatrical entertainment consisting of artistic dancing, posturing, and pantomimic action. Such performances were popular with the Greeks and Romans, and from early times the b. flourished throughout Italy—a notable performance of the kind being that given at Tortona to celebrate the marriage of the Duke of Milan in 1489. The b. was introduced into France by Catherine de' Medici, who wished to divert the attention of her s. (Henry III.) from State affairs. Henry IV., Louis XIII. and XIV., and Cardinal Richelieu all spent lavish sums on these entertainments, the three kings being themselves frequent performers in them. Women did not appear in b's until 1681, when four lady dancers took part in *Le Triomphe de l'Amour*. The earliest b. performed in London was *The Tavern Bickers*, at Drury Lane, 1702. The word 'balette' was first used in English by Dryden in 1667.

BALL-FLOWER, architectural decoration (like ball enclosed in flower) largely used during XIV. cent.; good examples may be seen in Gloucester Cathedral.

BALLIA (25° 44' N., 84° 11' E.), district and town, Benares, United Provinces, India; rice, sugar-cane; area of dist., 1245 sq. miles. Pop. 987,768.

BALLINA (54° 6' N., 9° 12' W.), market town and seaport, County Mayo, Ireland; salmon fishery. Pop. 4500.

BALLINASLOE (53° 19' N., 8° 14' W.), market town, County Galway, Ireland; corn mills. Pop. 5000.

BALLINROBE (53° 38' N., 9° 13' W.), town, Mayo, Ireland.

BALISTA, BALISTA, Rom. engine of warfare, which utilised principle of cross-bow to hurl missiles. See **ARBALIST**.

BALLISTICS, science treating of projectiles (q.v.). See also **CHRONOGRAPH**.

BALLOON, bag made of light and strong material, e.g. silk, and filled with a gas so as to rise and float in the air, which it does when the weight of the whole is less than the weight of an equal volume of air. In mediæval times various suggestions were made by philosophers and others to enable metal spheres and other vessels to float in the air, but the first b. was invented in 1782 by the bro's Joseph and Jacques MONTGOLFIER, paper-makers at Annonay, near Lyons, who inflated a paper bag over a fire with smoke so that it ascended into the air. They reproduced this experiment on a larger scale, and were imitated in Paris by CHARLES and the bro's ROBERT in 1783, who, however, substituted hydrogen gas as an inflating agent. In that year the Montgolfiers carried out their famous experiment before the king and queen at Versailles, sending up a large decorated b. inflated with smoke and heated air (it was later ascertained that not the smoke, as the Montgolfiers supposed, but the lighter heated air was the agent that enabled their b's to rise), to which was attached a cage carrying a cock, a duck, and a sheep, which were found to be uninjured when the b. descended.

In 1783, also, the first human being, DE ROZIER, ascended in a captive and later in a free fire-b., while only a few days later Charles, who invented the valve, netting, and other accessories, ascended in a b. inflated with hydrogen. The first person in Britain to rise in a b. was TYTLER, who ascended at Comely Gardens, Edinburgh, in 1784, in a fire-b. constructed by himself, some days before the first ascent by the well-known LUNARDI, at London. In 1785 the Eng. Channel was first crossed in a b. by BLANCHARD and JEFFERIES, and in 1836 another famous b. voyage was made by HOLLAND, MASON, and GREEN, from London to Weilburg, in Nassau, about 500 miles, in 18 hours. In 1912 BERNHARD made a voyage in a b. from Stuttgart, Germany, to near Moscow, Russia, a distance of nearly 1862 miles.

As early as 1784 the b. was employed for making scientific observations, and between 1862 and 1868 numerous ascents were made by GLAISHER for the purpose of making barometrical and thermometrical observations, collecting air at different altitudes for analysis, etc., on behalf of the Brit. Association, ascending on one occasion to a height of 37,000 feet. B's and kites are much used for meteorological experiments (see METEOROLOGY), either carrying passengers to make observations or merely with instruments attached.

B's have also been employed for making reconnaissances in war, being used in the Fr. revolutionary wars at the beginning of the XIX. cent., in the Ital. campaign (1859), in the Amer. Civil War (1861), and in practically all modern wars and army manoeuvres, while in the Franco-Prussian War (1870-71) communication was kept up between besieged Paris and the provinces by means of b's.

Dirigible Balloons.—The problem of controlling the direction of b's was the cause of experiments from the very beginning of ballooning, the bro's Robert, who were among the first balloonists, employing oars worked by hand for this purpose, with little if any success. In 1852 GIFFARD attached a steam-engine to a b.-car, and was able to deviate slightly from the direction of the wind; the bro's TISSANDIER (1884) employed an electric motor with a spindle-shaped b., and were successful to some extent in their object, and the French War Department subsequently experimented on the lines they had taken.

In 1900 Count VON ZEPPELIN finished the construction of a spindle-shaped rigid air-ship, consisting of numerous gas-bags enclosed in an aluminium framework with powerful motors attached, which, on experiment, travelled at the rate of 18 miles per hour, and since that time he has built a number of air-ships on the same design, with improved details, one of which has attained a speed of 37 miles per hour, but his air-ships have been very unfortunate

in regard to accidents. In 1901 SANTOS DUMONT won the *Deutsch* prize for encircling the Eiffel Tower in Paris with a cigar-shaped balloon, his motive-power being a small petrol engine, and since then, in Germany, France, and Britain more particularly, but also in Italy, Belgium, and other countries, quite a large number of air-ships of the cigar-shaped balloon and petrol-engine type have been constructed, many of them under the auspices of the different armies and navies, in several of which aeronautical corps have been established.

Considerable journeys have been made by dirigible b's, especially by the rigid air-ships of von Zeppelin, one of which in 1909 accomplished a voyage of 870 miles in 37 hours, while attempts, which have proved vain, have been made to reach the North Pole from Spitzbergen (see ANDRÉS) and to cross the Atlantic. See also FLIGHT.

BALLOT (Ital. *ballotta*, a small ball) signifies a device for secret voting, the name originating in Gk. practice of voting by ball, the white or unpierced ball dropped into voters' box showing approbation, the black ball denoting disapproval—what we still call 'black-balling.' The Romans adopted a similar system, II. cent. B.C., but voted on pieces of wood. The idea has been adopted for elections by modern democracies; used in New England States from 1775; agitation for its use commenced in England with general agitation for Parliamentary reform at beginning of XIX. cent.; definitely adopted as part of Liberal programme, 1831. France (1852), Italy (1861), and Brit. Colonies (Australia, 1856) set the example; English Ballot Act, 1872, drawn up by W.E. Forster on Australian model, enforces voting by ballot of parliamentary and municipal elections. Names of candidates are printed in alphabetical order on a white, stamped paper; voter puts an x against name he approves, folds paper, and hands it to official, who drops it into locked, sealed box.

The **Second B.** is employed—or advocated—where the candidate at top of poll in a three or more cornered election has not been returned by more than half the total votes; in the second election the two top candidates of first b. alone present themselves.

BALLOU, HOSEA (1771-1852), Amer. preacher; s. of a Baptist minister; convert to Universalism (1789); founded *The Universalist Magazine* (1819), *The Universalist Expositor*, *The Universalist Quarterly Review*, etc.

BALLSTON SPA (43° 2' N., 73° 55' W.), summer resort, Saratoga County, New York, U.S.A.; mineral springs. Pop. (1910) 4138.

BALLYCASTLE (55° 12' N., 6° 15' W.), market town, County Antrim, Ireland; summer resort.

BALLYMENA (54° 52' N., 6° 17' W.), town, County Antrim, Ireland; brown linen. Pop. 11,000.

BALLYMONEY (56° 3' N., 6° 31' W.), market town, County Antrim, Ireland; breweries, tanneries.

BALLYMOTE (54° 5' N., 8° 31' W.), market town, County Sligo, Ireland; carriage-building works.

BALLYSHANNON (54° 29' N., 8° 12' W.), seaport town, County Donegal, Ireland; salmon fisheries.

BALM (*Melissa officinalis*), fragrant Labiate herb, growing in S. Europe, also S. England. See BALSAM.

BALMACEDA, JOSE MANUEL (1838-91), Pres. of Chile Republic.

BALMAIN (34° S., 151° E.), town, Cumberland, New South Wales, Australia; sawmills; iron foundries. Pop. 31,000.

BALMAT, JACQUES (1762-1834), Alpine guide; first to reach highest summit of Mont Blanc (1786).

BALME, COL DE, famous pass of Rhône Valley between Chamonix and Martigny; height over 7000 ft.; magnificent views.

BALMERINO (56° 25' N., 3° 2' W.), village, Fife, Scotland, from which the Elphinstones took their title. JAMES ELPHINSTONE (c. 1553-1612), 1st Lord B., Scot. politician, was sentenced to death as traitor, 1609, for friendly correspondence with Pope, but spared,

as James I. might have been inculpated. Last baron was beheaded, 1764, for part in the '45.

BALMORAL CASTLE, royal residence, Deeside, Aberdeenshire, Scotland; estate was purchased by Queen Victoria in 1851, and present castle was erected from designs of Prince Consort, 1855.

BALNAVES, HENRY (1612-79), Scot. reformer; an active member of James V.'s privy council; favoured an alliance with England; taken by the French at surrender of St. Andrews Castle (1647), and was for several years kept a prisoner at Rouen; one of Bothwell's judges in Darnley murder case.

BALNEOTHERAPEUTICS, see **BATHS**.

BALQUHIDDER (56° 20' N., 4° 20' W.), village and parish, Perthshire, Scotland; Rob Roy's burial place.

BALRAMPUR (27° 25' N., 82° 15' E.), town, United Provinces, India; cotton. Pop. 16,800.

BALSAM, substance which is a mixture of an oleoresin with benzoic acid or cinnamic acid, or with both; those used in med. are: b. of Peru, b. of Tolu, prepared storax (*Styrax preparatus*) and benzoin—the two former used chiefly in perfumery, and the two latter in ointments for some skin diseases, and together in a tincture as an expectorant; *balm of Gilead* (much prized in the East) and Canada b. (used in microscopic preparations) contain neither benzoic nor cinnamic acid, and should not therefore be included among b's.

BALTA (48° 3' N., 29° 33' E.), town, Podolia, Russia. Pop. 23,393.

BALTCHIK, BALTJIK (43° 25' N., 28° 13' E.), port, Bulgaria. Pop. 6000.

BALTEAZAR, see **BELSHAZZAR**.

BALTIC, OSTSEE (57° N., 19° E.), inland sea, N. Europe, surrounded by Sweden, Russia, Germany, and Denmark, connected with North Sea by Sound, Great Belt, Little Belt, Cattoget, Skager Rack, Kaiser Wilhelm Canal; in N. is Gulf of Bothnia, in E. Gulf of Finland; principal islands are: Åland Islands, belonging to Russia; the Dan. islands of Zealand, Fünen, Lolland, and Bornholm; Gotland and Öland, belonging to Sweden; length, c. 950 miles; greatest width, c. 360; area, c. 170,000 miles; length of coast line, 5000 miles; average depth, 20 fathoms, deeper in N. end; little tide, except at entrance; navigation dangerous; great part frozen in winter. B. Sea at Kiel and North Sea at mouth of Elbe were connected by Canal, 1895.

BALTIMORE (39° 17' N., 76° 37' W.), town, Maryland, U.S.A., on left bank of Patapsco, an inlet of Chesapeake Bay. Founded in 1729, B. became city in 1796; as shipping trade developed, merchant ships called 'Baltimore clippers' became known throughout world; repulsed British in 1814, when they attacked city; suffered from fire, 1904. Built on undulating ground, B. has fine public buildings, including white marble court-house and city hall; R.C. cathedral, library, etc.; seat of Johns Hopkins Univ., law and medical faculties of Maryland Univ., college for negroes, medical coll., etc.; Johns Hopkins Hospital ranks with finest in Europe; many other hospitals and asylums; finest park is Druid Hill Park. B. is only port of great importance in Maryland; railway, commercial, and manufacturing centre; fine spacious harbour, and enormous elevators for coal and grain; exports cereals, flour, cotton, tobacco, copper, meat, tallow, lumber, sheep, etc.; industries include fruit-, vegetable-, beef-, and oyster-canning, shipbuilding, manufacture of bricks, clothing, fertilisers, furniture, cotton duck, iron, steel. Pop. (1910) 558,485.

BALTIMORE, GEORGE CALVERT, 1ST BARON (d. 1632), Eng. statesman; b. Kipling (Yorks); ed. Trinity Coll., Oxford; frequently employed in State affairs by James I.; knighted, 1617; Sec. of State, 1619; cr. Baron B., 1625; was the founder of the Avalon colony in Newfoundland, 1621. His s. Cecilus, 2nd Baron B., was the founder of Maryland.

BALTISTAN, LITTLE TIBET (35° 24' N., 75° 25' E.), district, Kashmir, India; crossed by Karakorum

Mountains, which culminate in Mt. Godwin Austin, over 28,000 ft. high; drained by Indus.

BALUCHISTAN, BELUCHISTAN, country, S.W. Asia, between Afghanistan and Arabian Sea; area, c. 134,000 sq. miles. Coast-line extends about 500 miles, but there are no good harbours. Considerable portion is under Brit. control, called **British B.**, in N.W.; whole is within Brit. sphere of influence. Surface generally consists of dry tablelands, but there are low-lying plains in E. Principal mountains are Suliman system in N., Kirthar range in E., Pab Hills in S., Sarawan and Jalawan ridges in Kalat plateau in S.W.; chief rivers, Nari, Bolan, Badra, in E.; chief town, Kalat. Climate has extremes of cold and heat; rainfall slight.

Early history of B. is veiled in obscurity; ruled by Hindu rajahs till XVII. cent., when last raja applied for aid to Kambur, chief of mountain tribe, who eventually deposed him and established Muhammadan religion. In following cent. Nadir Shah established Persian influence in country, and appointed as ruler Nasir Khan in 1730. In 1839 Kalat was attacked and captured by British, who, however, evacuated it in 1841, having concluded treaty of friendship. Other treaties were concluded on two subsequent occasions, and British B. was established in 1887.

Fruits, cereals, and potatoes are grown; camels, horses, oxen, and cows kept. Minerals include coal, iron, lead, asbestos, chromite, salt, but are little worked. There are few manufactures; needlework, felts, pottery, etc., made; exports dates, dried fish, etc.

British B. and the political agencies of Quetta-Pishin, Zhob, Loralai, Bolan Pass, Sibi, and Chagai are directly governed by chief commissioner, who also, as gov.-gen.'s agent, supervises administration of remainder of country, comprising native States of Kalat and Las Bela, and tribal areas.

Inhabitants are chiefly of Pathan, Brahmin, and Baluch races; Pathans found in directly administered districts, Brahmins in middle, Baluchs in S.; there are also Lasis, Saiads, Chuttas, and other races, including Persians. Islam is principal religion, but there are some Hindus and a few Christians and Sikhs. Pop. (1911) 829,712. Map, see **PERSIA**.

Floyer, *Unexplored Baluchistan* (London, 1892); Holdich, *Indian Borderland* (London, 1901); Hughes, *The Country of Baluchistan* (London, 1877).

BALUE, JEAN LA (1421-91), Fr. cardinal; almoner to Louis XI., who obtained cardinalate for him (1468); as crafty and treacherous as his master, after whose humiliation by Charles the Bold he entered into an intrigue with the Burgundian; was discovered, and suffered eleven years' imprisonment. After release, he lived in high favour at Rome.

BALUZE, ÉTIENNE (1630-1718), Fr. scholar; pub. *Capitularia Regum Francorum* (1674); *Nova Collectio Conciliorum* (1677); *Letters of Pope Innocent III.* (1682); *Vita Paparum Avenionensium, 1305-94* (1693).

BALZAC, HONORÉ DE (1799-1850), Fr. novelist; b. Tours; ed. Collège de Vendôme and Sorbonne; intended by his f. for the law, Honoré had other intentions, and went to Paris (1819) to seek his fortune as an author. Here for ten years he struggled, achieving no success. It was not until he was thirty that he made a reputation with his *Les Derniers Chouans*, followed by *La Peau de Chagrin*, and other novels. Then he conceived the idea of presenting, under the general title of the *Comédie Humaine*, a large series of novels which should give a complete panorama of modern life, including men and women of every rank and occupation. With this purpose in view, B. produced in rapid succession *La Recherche de l'Absolu*, *Le Père Goriot*, *Les Illusions Perdues*, etc. He wrote some eighty novels in twenty years, working sometimes eighteen hours daily, yet he was involved in debt to the end of his days. Criticism has raged round B.'s writings, and, despite his unique position, he is far from receiving unmixed eulogy from important critics. Many of his books are devoted to the emotions of trivial people, and the excitements

and ideals of the drawing-room, and the wit which makes such things acceptable is lacking; though that B. had a genuine, if not subtle, sense of humour is shown by the *Contes drolatiques*. He is at his lightest and happiest in sketching tragedies of common people like *Le Père Goriot*; he sought force rather than felicity of wording.

Lawton, *Life* (1910); Saintsbury has written critical prefaces to his Eng. edit. (1895-98); monograph by Brunetière (1906); Helm, *Aspects of B.*

BALZAC, JEAN LOUIS GUEZ DE (1594-1654), Fr. author; b. Angoulême; elegant writer, much patronised by Cardinal Richelieu; excoriated much influence on Fr. language; chiefly known for his *Lettres*, and *Lettres inédites*.

BAM (29° 10' N., 58° 18' E.), town, Kerman, Persia; famous citadel.

BAMAKO (12° 10' N., 8° W.), capital, Upper Senegal-Niger, Fr. W. Africa. Pop. 6500.

BAMBARRA (12° N., 7° 12' W.), district, Fr. W. Africa; inhabited by mixed race of same name; chief town, Bamako (q.v.), Sego. Pop. c. 2,000,000.

BAMBERG (49° 54' N., 10° 58' E.), manufacturing town, Bavaria; former independent bishopric, secularised, 1801; annexed by Bavaria, 1803; magnificent Romanesque cathedral (1004), containing tomb of founder, Henry II.; important trade, cotton, silk, tobacco. Pop. 45,460.

BAMBERGER, LUDWIG (1823-99), Ger. politician and economist; prominent authority on finance and economics; promoted the gold currency, developed the Ger. Imperial Bank, and was a strong opponent of bimetallicism.

BAMBINO, name for representations of the infant Christ in swaddling clothes; especially figure preserved in Rome, believed to work miracles.

BAMBOO (*Bambusae*), tribe of grasses, often tree-like (120 ft. high), growing in tropics, but spreading to subtropical and temperate zones; cultivation possible even to snow-line of Himalayas and Andes. The 23 genera are put to multifarious uses; succulent shoots and fruits for food; stems for buildings, masts, cooking vessels, writing-reeds, weapons; strips of outer cuticle are excellent material for basket-making and other wicker-work; in China, internal portions pulped for paper-manufacture.

BAMBUK (13° N., 11° W.), mountainous district, Fr. W. Africa; produces gold, iron, timber, fruit, cereals; live stock raised. Pop. c. 800,000.

BAMBURGH, BAMBOROUGH (55° 37' N., 1° 43' W.), village, Berwick-upon-Tweed, Northumberland, England; castle founded by Ida, about 547, stands on rock projecting into North Sea; fortress in mediæval wars; monument to Grace Darling (q.v.); sea-coal, lead mines.

BAMBUTE, African nomad race of pygmies found on western borders of Uganda Protectorate; they wear absolutely no clothes, do not decorate their persons; are fond of music; shoot game with poisoned arrows; average height about 4 ft. 6 in.

BAMFORD, SAMUEL (1788-1872), Eng. labour politician; a weaver by trade; wrote *Passages in the Life of a Radical* (1840-44) and poems in the Lancashire dialect.

BAMIAN (34° 49' N., 67° 28' E.), mountainous valley (8500 ft.), Afghanistan; ruins of ancient city; seat of Buddhist worship, enormous idols (one 173 ft. in height) carved in rocks, which form N. side of valley; caves, wild and deep passes.

BAMPTON.—(1) (50° 59' N., 3° 29' W.) town, Devonshire, England. Pop. (1911) 1572. (2) (54° 34' N., 2° 45' W.) town, Westmoreland, England.

BAMPTON-IN-THE-BUSH (51° 44' N., 1° 33' W.), town, Oxford, England. Pop. (1911) 4666.

BAMPTON, JOHN (1690-1751), Eng. theologian; founder of B. Lectures for defence of Christianity.

BAMPUR (27° 12' N., 60° 18' E.), town, Persia.

BAMRA (21° 30' N., 84° 23' E.), native state, Bengal, India; timber; area, 1988 sq. miles. Pop. 123,000.

BAN, Persian title, meaning 'lord or master,' brought into Europe by the Avars; later it meant 'to proclaim,' 'to announce'; in Fr. it is the name of the section of the population first liable for military service, while *arrière-ban* means the reserve; by Shakespeare, Milton, and other Eng. writers it is used in the sense of 'to forbid'; it retains its earlier meaning of 'to proclaim' in 'banns of marriage.'

BANANA (*Musa*), tropical, perennial herbaceous plant; about 40 species, cultivated for food; *M. corniculata* produces a single fruit requiring cooking; leaves are used for packing, plaiting mats, etc. Manila hemp is prepared from *M. textilis*; b. is native of tropics of Old World, but is now distributed throughout the hot regions of America; large quantities exported from West Indies and Canaries; b. closely allied to the plantain (q.v.); latter more farinaceous than b., and is generally cooked.

BANANA.—(1) (8° 8' N., 13° 6' W.) volcanic island, Sierra Leone, Africa. (2) (6° S., 12° 17' E.) seaport, Belgian Congo, Africa; exports rubber, palm oil, ivory.

BANAT, BANSÁG (45° 35' N., 21° 30' E.), district, S.E. Hungary, comprising counties Torontal, Temes, and Krassó Szörény; fertile; wheat, vineyards, minerals, silk.

BANBRIDGE (54° 22' N., 6° 17' W.), market town, County Down, Ireland; linen. Pop. 5000.

BANBURY (52° 4' N., 1° 19' W.), market town, Oxfordshire, England; incorporated by Queen Mary (1553); ancient cross, noted in nursery rhyme, destroyed by Puritans, 1610; famous cakes; rope, leather. Pop. (1911) 13,463.

BANC, med. Lat. expression, in *banco*, applied to justices sitting on bench (*bancus*), gave rise to expression in b. for sittings of courts.

BANCA, see **BANKA**.

BANCROFT, GEORGE (1800-91), Amer. historian; b. Worcester (Mass.); ed. at Harvard and several Ger. univ's; for a time Sec. of the Navy, and Sec. of War, and minister to Great Britain (1846-49); associated with Goethe, Humboldt, Macaulay, and Hallam. He was the author of a monumental *History of the United States*, which began to appear in 1834.

BANCROFT, HUBERT HOWE (1832-), Amer. historian; originally a San Francisco bookseller; pub. *Native Races of the Pacific States* (1874-76); *History of the Pacific States of North America* (1882-90).

BANCROFT, RICHARD (1544-1610), Eng. theologian; bp. of London, 1597, abp. of Canterbury, 1604; staunch anti-Puritan controversialist, particularly at Hampton Court Conference, 1604.

BANCROFT, SIR SQUIRE (1841-), Eng. actor and theatre manager; first appearance, 1861; m. Miss Effie Wilton, with whom he was afterwards associated in management of the Prince of Wales theatre. He retired, 1895, and was knighted, 1897.

BAND.—A brass b. uses only brass wind instruments, like trumpet, a string b., string instruments, such as violin; a regimental or military b. has various brass and wooden wind instruments, drum, and triangle, and is prominent feature of regiment. An annual brass b. contest is held at Crystal Palace.

BAND FISHES (*Cepolidae*), 10 species of crimson, small-scaled, 'bony' fishes, inferior as food; the red b. f. (*Cepola rubricens*) is a rare Brit. fish. The rest are widely scattered.

BANDA (25° 28' N., 80° 25' E.), capital and district, Allahabad, India; area, 3061 sq. miles; barren; trade in cotton; produces millet, rice. Pop. 631,058.

BANDA ISLANDS (40° 30' S., 130° E.), group of Molucca islands, Dutch East Indies; chief town, Nassau, in Banda Neira; frequent earthquakes, volcanoes; nutmegs, sago. Pop. 9000.

BANDA ORIENTAL, old name for Uruguay (q.v.).

BANDANA, Ind. name for a silk handkerchief, dyed in a particular way, and usually bearing a pattern of lozenges, or spots; now generally applied

to a class of cotton handkerchiefs manufactured in Lancashire.

BANDEL, ERNST VON (1800-76), Ger. sculptor erected gigantic statue of Arminius at Detmold.

BANDELIER, ADOLPH FRANCIS ALPHONSE (1840-), Swiss-Amer. archaeologist; emigrated to U.S.A. as a youth, and made a special study of Inca civilisation.

BANDELLO, MATTEO (1480-1562), Ital. novelist wrote a collection of *Novelle* (1554-73) in the manner of Boccaccio's *Decameron*, which served as a quarry for the Eng. Elizabethan dramatists. Shakespeare derived several of his plots from B.

BANDER ABBASI, BANDER ABBAS (27° 13' N., 56° 23' E.), seaport town, Persian Gulf, Kerman province, Persia; formerly called *GOMBRUN*; renamed after Shah Abbas I., who with aid of English drove Portuguese out of Ormuz, 1622, and transferred portion of trade to B. A.; extensive trade with India and Europe; cotton, raisins, indigo. Pop. c. 6000.

BANDER LINGAH (26° 35' N., 54° 40' E.), seaport town, Persian Gulf, Persia; pearl fisheries.

BANDICOOT, small marsupials of genus *Perameles*, native of Australia, Tasmania, New Guinea, and some adjacent islands.

BANDICOOT-RAT (*Nesocia bandicota*), Asiatic, especially Ind. and Cingalese rodent, an aberrant form of b. with long hind feet.

BANDIERA, ATILIO and EMILIO (d. 1844), Ital. patriots; sons of an Austrian admiral; were associated with Giuseppe Mazzini and others in the cause of Ital. liberation. They were betrayed by one of their party, and executed.

BANDINELLI, BARTOLOMMEO, BAOTTO (1493-1560), Ital. sculptor; vainly vied with Michael Angelo; some of his best work is to be found in the Cathedral of Florence.

BANDIT, see under **THEFT**.

BANDOLINE, preparation from Irish moss, quince seeds, or gum tragacanth used for hair.

BANDON, BANTONBRIDGE (51° 44' N., 8° 43' W.), market town, County Cork, Ireland; distilleries.

BANDS, two linen strips at front of neck, worn by R.C. priests, Lutheran, Presbyterian, and other 'Reformed' ministers, and as legal and academic badge.

BANDY, name given to hockey when played on ice.

BANEHERRY, HERB CHRISTOPHER (*Actaea spicata*), poisonous ranunculaceous herb of N. temperate zone.

BANER, JOHAN (1598-1641), Swed. general; principal military leader under Gustavus Adolphus; invaded Bohemia, and won a complete victory over the Saxons at *Chemnitz*.

BANFF.—(1) (57° 40' N., 2° 32' W.) royal and parliamentary burgh, seaport, and county town, mouth of Deveron, Banffshire, Scotland; of great antiquity; fishing, agriculture; woollens. Pop. (1911) 3821. (2) (51° 15' N., 115° 38' W.) town, Alberta, Canada; thermal sulphurous springs.

BANFFSHIRE (57° 28' N., 3° 4' W.), county, N.E. Scotland; between Elgin, Inverness, and Aberdeen; area, c. 631 sq. miles; agriculture important; oats, barley, wheat grown, cattle raised; industries include distilling, fisheries; granite, slate, etc., quarried; surface hilly in S., low-lying in N.; well wooded; drained by Spey, Deveron, Avon, Livet; chief mountains, Ben Macdui, Cairngorm; capital, Banff. Pop. (1911) 61,402.

BANFFY, DESIDERIUS (1843-), Hungarian premier (1895-99); forced to resign through violence of opposition; leader of New Party, 1905.

BANG, HERMANN JOACHIM (1858-), Dan. novelist; pub. *Faædra* (1883), *Tine* (1889), and other novels, also poems and miscellaneous works.

BANGALA, town and administrative district, Belgian Congo, Africa.

BANGALORE (12° 57' N., 77° 35' E.), chief town, native state of Mysore, India; military station; salubrious, over 3000 ft. above sea; fertile, permanent water supply; fort captured by Lord Cornwallis, 1791;

cottons, carpets. Pop. (1911) 189,485. District of B. has area, 3092 sq. miles. Pop. 879,263.

BANGANAPALLE (15° 15' N., 78° 15' E.), native state, Karnul district, Madras, India; capital, B.; area, 255 sq. miles. Pop. (1911) 39,300.

BANGASH, Pathan tribe, living near Kohat; noted for fine physique and military ardour.

BANGKOK (13° 45' N., 100° 28' E.), capital, Siam, on delta of river Menam. The city has been greatly improved in cleanliness and health by the persistent clearing away of the small wooden houses. There are electric trams. The Royal palace, the Government offices, and the finest temples are within the walled town. Chinese control most of the trade. The most important export is rice, amounting to nearly 27,000,000 in 1910-11; teak, £583,000. Pop. 628,700, about 1000 of them being European.

BANGOR.—(1) (54° 39' N., 5° 40' W.) small seaport and watering-place, County Down, Ireland. Pop. 6000.

(2) (53° 13' N., 4° 7' W.) seaport, city, and market town, Carnarvonshire, Wales; holiday resort, Univ. Coll. of N. Wales and Normal Training Coll.; Cathedral (founded, c. 525); slate quarries. Pop. (1911) 11,237.

(3) (44° 47' N., 68° 46' W.) city and seaport, seat of Penobscot County, Maine, U.S.A.; on W. bank Penobscot, at head of navigation; seat of Congregational theological seminary; extensive manufactures, boots and shoes, machinery. Pop. (1910) 24,803.

BANGORIAN CONTROVERSY, see **ROADLY, BENJAMIN**.

BANGWEULU, BANGWEULO (12° S., 30° E.), lake, Brit. Central Africa; discovered by Livingstone, 1868; area variable; in dry season, 1670 miles; forms headwaters of Congo.

BANIAN (Sanskrit *vanij*, merchant), member of Hindu trading caste; to be found in all large towns of Asia and many commercial centres of Africa.

BANIM, JOHN (1798-1842), Irish novelist; wrote *Tales of the O'Hara Family* (1825), 2nd series (1826); assisted by his bro. **MICHAEL** (1796-1874).

BANISHMENT, legal penalty which consists in segregation of the offender from the community. It was frequently inflicted in Greece and Rome, in preference to the death sentence, and it was probably as a classical punishment that Sir Thomas More advocated its use in his *Utopia*. In England b. was not recognised as a punishment until 1597, when it was adopted as expedient for ridding the country of the sturdy rogues who had baffled economists throughout the century; but death might be escaped by taking sanctuary, renouncing allegiance, and abjuring the land. That the old Borders between England and Scotland continued to be lawless is shown by statute of 1667, permitting Transportation of criminals of those regions; imprisonment for life was often commuted to transportation until this was abolished by Acts of 1853 and 1857. By an unrevoked statute b. is still penalty in Scotland for celebrating clandestine marriages.

B. (or Exile) as punishment for political offences was practised by Gks. as *ostracism* (q.v.), and by Romans as *proscription*. By clause of Magna Carta b. might not be inflicted on Eng. freeman except after lawful trial; Richard II.'s illegal b. of Bolingbroke was immediate cause of his own deposition. Under the Catholic Emancipation Act of 1829, however, unregistered Roman Catholics may be banished. B. is still inflicted for political offences in Russia, etc.

BANJALUKA (44° 47' N., 17° 11' E.), town, Bosnia; tobacco. Pop. 14,812.

BANJERMASIN (3° 25' S., 114° 37' E.), town, capital of Dutch Borneo, East Indies; spices, gold. Sultanate of B. ended 1857. Pop. 50,000.

BANJO, musical instrument, popular in U.S.A., consisting of a long wooden neck, bearing a metal or wooden hoop for body, over which is stretched a sheet of vellum, and having from five to nine strings. Apparently of African origin, for similar instruments, with grass strings, are still used on the Guinea coast.

Introduced into U.S.A. probably in XVII. cent., and about 1846 into England by Amer. negro minstrels.

BANKA, BANCA (2° 30' S., 106° E.), island, Dutch East Indies; length, 157 miles; narrow, hilly; chief town, Muntok; tin, bananas; area, 4480 sq. miles. Pop. 115,189.

BANKET, term for auriferous conglomerate in S. African goldfields. See **GOLD**.

BANKIPUR (20° 33' N., 88° 25' E.), ancient village, on Hugli, Bengal, India.

BANKRUPTCY.—The law of b. in Britain affords relief to insolvent debtors, who, by surrendering their property for the benefit of their creditors, are relieved from liability in regard to their debts. One creditor is prevented from obtaining undue advantage over his fellow-creditors, either by making a secret arrangement with the debtor, or by his own fraud. The debtor is prevented from taking improper advantage of his creditors, and is punished if he is guilty of fraud. The administration of the bankrupt's estate, until a trustee is app., is carried out under the supervision of an *Official Receiver* app. by the Board of Trade. There is a difference between a person who is *insolvent* and a *bankrupt*. An insolvent trader is one who, if pressed for payment, would not be able to meet all his liabilities; but by means of loans, or part payment of debts, he may contrive to avoid b. altogether.

Proceedings in b. are commenced by a creditor or creditors with aggregate claims of £50, on proof of their claim and the commission by debtor of an 'act' of b.: 1, failure to satisfy creditor on a bankruptcy notice; 2, the making of an assignment for the creditors generally; 3, his absconding or keeping house; 4, giving notice of suspending payments; 5, filing a declaration of inability to pay; 6, if his goods are seized. (In U.S.A., 2, 3, and 5 are acts of b., and giving any creditor a preference is also an act. Intent is needed in Brit. law to make last-named an act. In U.S.A. a petitioning creditor must be owing \$500 out of \$1000 or over.) The Court, on being satisfied as to the matters alleged in the petition, issues a 'receiving order.' The official receiver thereby becomes the receiver or protector of the property until a trustee is app. by the creditors. Within seven days of the receiving order being made, the debtor must furnish to the official receiver his statement of affairs, after which he will be required to attend for public examination on oath. The official receiver makes a report on the debtor's statement of his affairs, and to a great extent the debtor's discharge depends on the nature of this report. Within fourteen days after the receiving order, a general meeting of the creditors is held, and this meeting decides whether the debtor shall be adjudged bankrupt, or whether a composition or an arrangement shall be accepted from him. If the debtor is adjudged bankrupt, the creditors then appoint a trustee to wind up the bankrupt's estate, or, failing them, the Board of Trade appoints a trustee, and it is his duty to realise the property and to divide the proceeds amongst the creditors. At any time after he has been adjudged bankrupt, but not until his public examination has been concluded, the bankrupt may apply for his discharge. The Court may grant, refuse, or suspend the discharge, or may grant it conditionally. The Court will, as a rule, grant the discharge, provided that a good dividend has been paid, that the bankrupt shows that his accounts have been properly kept, that he has not been recklessly extravagant, or indulged in rash or hazardous speculation, or been guilty of misdemeanour in his business. The Court, however, must suspend the discharge for two years at least in such circumstances as the following: when a dividend of 10s. in the £ has not been paid; when the bankrupt has not kept proper books for three years preceding his b.; when he has contracted debts with no reasonable prospect of being able to pay them; or when he has been previously adjudged bankrupt. In U.S.A. discharge may be refused if bankrupt gained credit by false written statement, within four months

of filing petition removed or destroyed property to delay or defraud creditors, or refused to obey order or answer question of Court.

If an undischarged bankrupt obtains credit of £20 or upwards, without disclosing that he is undischarged, he is liable to two years' imprisonment; all property accruing to him until he receives his discharge will go to his creditors; and he cannot sit or vote in either House of Parliament, or act as a J.P., or fill the office of county or borough councillor, or sit on various other local boards.

Where the estate of the debtor is not likely to exceed £300, the court may order it to be summarily administered with the object of saving time and expense. In London, b. business is administered by the High Court; in the provinces by the local County Courts.

Williams, *Law and Practice of Bankruptcy* (7th ed., 1898); Robson, *On the Law of Bankruptcy* (6th ed., 1887); Goudy's *Law of Bankruptcy in Scotland* (1895).

BANKS, a crude system of banking appears to have existed amongst the ancients several cent's before Christ, while among the later Greeks and Romans the regulation of b's was established upon a fairly well-defined basis. These early b's received money, sometimes, but not always, at interest, and repaid it at their customer's written order, or at a stipulated time, charging a commission like all modern b's. But banking, as it is now understood, first came into existence in 1157, when the *B. of Venice* was established. Other early banking establishments were the *B. of Barcelona* (1401), the *B. of Genoa* (1407), the *B. of Amsterdam* (1609), the *B. of Hamburg* (1619), and the *B. of Stockholm* (1668), said to have been the first European b. to issue *b.-notes*. The Amsterdam b., during the cent. following its foundation, became the world's central depository.

The foundation of the *B. of England* (1694) was due to a Scotsman, William Paterson, notorious also as promoter of the Darien Scheme. For a long period the London goldsmiths had changed foreign money and lent at interest. James I., Charles I., and Charles II. borrowed from the goldsmiths, and the account of James the First's relations with George Heriot, in Scott's *Fortunes of Nigel*, is familiar. The *B. of Scotland* was established, 1695; the *British Linen Co.* was launched as a trading concern in Scotland, 1746, but after 1762 confined itself to banking, and still flourishes; and the *B. of Ireland* was established, 1783. *Cheques* were first issued in England in 1781.

The U.S. National Banking System arose out of the large credit issues of the Civil War. National b's are controlled by Treasury. Cities of over 6000 inhabitants may have no National b. with less than \$100,000 capital, and this varies to \$25,000 in cities of less than 3000; half capital must be paid in before business can commence, and 25 % must be transferred in Government bonds to Treasury, which authorises issue of notes to full par (not exceeding market) value of bonds. County banks must maintain reserve of 15 % of outstanding notes and deposits, three-fifths of which can be redeposited in seventeen large (*reserve*) city banks. Reserve b's must keep 25 % reserve, but half can be in National b's in New York, Chicago, and St. Louis.

Bank-Note, promissory note, issued by a bank, and payable on demand; in England the lowest note is of £5 value; in Scotland and Ireland notes of £1 are issued. In U.S.A. the lowest note issued by National b's is for \$5, but Government issues them for \$2 and \$1. B. of England notes are printed in black upon water-marked paper. After once being returned to the b. they are not again put into circulation.

Bank-Rate, rate of discount charged by the chief, or State, banks, as opposed to the market rate. In England it is fixed by the Bank of England, and constantly fluctuates according to the scarcity or abundance of money in circulation.

Modern B's.—According to their functions b's are

either *b's of deposit*, or *b's of issue*. A *b. of deposit* has power to receive money from depositors, but not to issue notes. A *b. of issue* has the right to receive deposits and issue *b.-notes*. In England and Wales the right to issue notes is confined chiefly to the B. of England. The B. of England is not a State B., but it is the B. in which State revenue is deposited, and is the agent for the Government in raising loans. On account of its peculiar business, other *b's* have found it convenient to deposit a certain amount of their cash with it, and every *b. which* is a member of the Clearing-House must keep an account at the B. of England. Apart from these circumstances, the B. of England is in the same position as all other *b's*, and conducts its business like other *b's*. The original capital of the B. of England was £1,200,000; in 1816 it amounted to £14,553,000, at which figure it has since remained.

Private B's and Joint-Stock B's.—The number of *private b's* is diminishing year by year. They cannot consist of more than ten partners, whose liability is unlimited. With regard to *Joint-Stock B's*, the legislation of 1826 prohibited the issue of notes for less than £5 in England and Wales; but it expressly permitted, outside a radius of 65 miles from London, the establishment of *Joint-Stock B's* with the right to issue notes; and withheld this right from all *b's* within the radius, excepting the B. of England. An Act was passed, 1833, permitting *Joint-Stock B's* to carry on a deposit business in London. Since the passing of Acts of 1826 and 1833, the business of *Deposit B's* in England and Wales has gradually increased and has reached gigantic proportions, largely owing, no doubt, to Companies Acts of 1858 and 1862, which allowed limitation of liability of shareholders. National *b's* are only *b's of issue* in U.S.A., but there are numerous *deposit b's*, and loan and trust companies which pay interest on deposits.

The Clearing-House.—A number of the London private bankers arranged, in 1775, a scheme (the Clearing-House) by which the representatives of each *b.* met daily and exchanged the cheques which each held on the other. The accounts so exchanged were added up, and the differences in the amounts only were handed over in cash. For many years the private *b's* had a monopoly of the Clearing-House, but in 1854 the *Joint-Stock B's* in London were allowed to join. There are still, however, only seventeen *b's* entitled to send representatives to the Clearing-House. All other *b's* must do their clearing business through the agency of a *b. which* is a member of the Clearing-House. By the system of *Country Clearing*, cheques held by country *b's* on other *b's* are sent to the Clearing-House, and thence are passed on to the London agents of the *b's* on which the cheques are drawn. The London agent sends these cheques nightly to his principals in the provinces. In this way each country *b.* ascertains what amount may be due by it to all other *b's*, and what it may be entitled to receive. The difference, if any, is then sent on to its London agent. Thus each *b.* has but one remittance to deal with each day, instead of having to make remittances to or to receive remittances from *b's* in all parts of the kingdom.

Banker and Customer.—The relation of banker and customer is that of debtor and creditor. The customer lends money to or deposits money with the banker, who thereby becomes its owner, but undertakes to repay it either by honouring the customer's cheques or by repaying the whole or part on due notice. That the banker becomes the owner of customer's money is shown by the fact that he trades with it and keeps profit. Again, were the bank to stop payment, the customer could not demand his money back, but merely rank as an ordinary creditor of the banker. Should a banker refuse to honour the cheque of a customer who has sufficient funds to his credit in the *b.*, such customer is entitled to damages, and can bring an action for

breach of contract. When a customer deposits securities with his banker as a guarantee for the repayment of a loan made by the banker, the latter has a lien on the securities—that is, a right to retain them until the loan has been repaid. Indeed, in some cases the banker, when the lien has once arisen, has a right to sell such securities and pay himself out of the proceeds. When a customer has deposited securities as a guarantee for a particular loan, the banker must return them when the loan is repaid, and has no further lien on them, even though the banker may have made other advances to him which have not been repaid. Of course, where the securities have been deposited to cover advances made by the banker generally, the banker has a lien on them until the whole amount has been repaid.

Savings B's.—1. Post Office; 2. Trustee. Former were established by Post Office Savings B. Act, 1861, to grant facilities, with State guarantee, for deposit of small savings at low interest; latter may only be formed with approval of National Debt Commissioners, not be run for profit, and are under State inspection.

Co-operative Credit B's originated in Germany where they are conducted either on Raiffeisen or Schulze-Delitzsch principles; Raiffeisen (*q.v.*) started in Rhenish Prussia, in 1849, loan banks which have gradually spread all over Germany and become a federation; Schulze started Schulze-Delitzsch banks, by which advances are made at low interest, 1860, as profitable investment rather than philanthropic effort. The 237 Irish Agricultural Credit B's established since 1889 are, in imitation of former class, for benefit of borrower; movement less popular in England and Scotland, but since 1901 (when Eng. Agricultural Organisation Society was formed) 46 credit *b's* (with Central Agricultural B.) have been established in Great Britain.

Bank Holidays.—By the *Bank Holidays Act* of 1871 the following days are kept as holidays: in England and Ireland, Easter Monday, Whit-Monday, 1st Monday in August, and Dec. 26; in Scotland, Christmas Day, New Year's Day, Good Friday, and 1st Mondays in May and Aug. By a *Bank Holiday (Ireland) Act*, 1903, March 17 was added as a Bank Holiday for that country. In U.S.A. 4th July and Christmas Day are the only universal B. H's, but some thirty others are recognised by various States.

Kerr, *History of Banking in Scotland*; Herbert, *The Law of B's and Banking*; Warren, *The Story of the B. of England*; Clayton, *Co-operation*.

BANKS ISLANDS (14° S., 168° 30' E.), New Hebrides, Oceania.

BANKS LAND (73° N., 121° W.), island, Arctic Ocean, Brit. N. America; named after Sir Joseph Banks (*q.v.*).

BANKS, SIR JOSEPH, Bart. (1743–1820), Eng. naturalist; undertook expedition to Newfoundland and Labrador, 1766; fitted out *Endeavour* expedition and accompanied Captain Cook to Pacific Ocean; Pres. of Royal Soc. (1778–1820).

BANKS, NATHANIEL PRENTISS (1816–94), Amer. politician and soldier; entered Congress and became Speaker; Gov. of Massachusetts, 1857–59; served on the side of the North in Civil War, holding command on the Potomac, in Shenandoah Valley, and elsewhere; captured Port Hudson, 1863.

BANKS, THOMAS (1735–1805), Eng. sculptor; studied in Rome; employed by Empress Catherine for two years at St. Petersburg; elected A.R.A. (1784), R.A. (1785); chief works are statue of Achilles in entrance hall of Burlington House, Shakespeare groups in garden of New Place, Stratford, monuments in Westminster Abbey and St. Paul's Cathedral.

BANKSIA, Australian shrub or tree (sometimes 50 ft. high) of the order *Proteaceae*, with yellow, red, or white umbellate flowers.

BANKURA (23° 14' N., 87° 7' E.), town, Burdwan, Bengal, India; indigo, silk. Pop. 21,000. District area, 2621 sq. miles. Pop. 1,116,411.

BANN (54° 23' N., 6° 28' W.), river, Ireland; flows through Lough Neagh; salmon.

BANNATYNE, GEORGE (1545–1608), Scot. merchant, famed for his collection of old Scot. poetry. The 'Bannatyne Manuscript' is preserved in the Advocates' Library, Edinburgh, and was pub. by the Glasgow Hunterian Club, 1873. The Bannatyne Club was founded at Edinburgh by Sir Walter Scott in 1823.

BANNERET (Fr.), high grade of knighthood, dating back to reign of Edward I., conferred upon the field of battle for distinguished service. The last recorded instance of its being conferred was by Charles I., in the case of John Smith, at *Edgehill*, 1642.

BANNER-STONES, axe-shaped stones found in U.S.A., probably ornamental.

BANNISTER, CHARLES (1738–1804), Eng. actor and vocalist, acted with Garrick at Drury Lane, and was a popular favourite.—**Bannister, John** (1760–1836), s. of the above; also acted with Garrick, and was regarded as the finest low comedian of his day.

BANNOCK ('Girdle-cake'), Scot. and N. English name for a flat unleavened cake of oat- or barley-meal, baked upon a girdle.

BANNOCKBURN (56° 6' N., 3° 55' W.), village, Stirlingshire, Scotland; scene of Robert the Bruce's great victory over Edward II. of England, June 24, 1314, by which Scot. independence was secured; site marked by Bore Stone in which Bruce planted his standard; carpet, tweed, and woollen factories.

BANNS OF MARRIAGE, public notice in church, thrice repeated, of an impending marriage, which was made a law in the Eng. Church by a Westminster Canon of 1200; the Lateran Council of 1215 made the publication of banns compulsory throughout Christendom. In America such a preliminary to marriage is not required. In England the ceremony may be avoided by means of a 'licence,' or 'special licence.'

BANNU (33° N., 70° 40' E.), town (Edwardesabad) and district, N.W. Frontier Prov., India; founded 1648 by Sir Herbert Edwardes; salt, alum. District area, 1680 sq. miles. Pop. 231,485.

BANQUETTE, ledge inside parapet of rampart, on which defenders can mount to shoot down at foe.

BANSDA (20° 45' N., 73° 28' E.), native state, Bombay, India; governed by rajput; area, 214 sq. miles. Pop. 40,382.

BANSHEE (Irish, *bean sídhe*; Gaelic, *ban síth*), a female goblin common to Celtic myth., but more particularly to the folk-lore of Ireland and the W. of Scotland. Heard at night, 'the Banshee's lonely croon' is believed to herald the death of some member of the family.

BANSWARA (23° 27' N., 74° 27' E.), state, Rajputana, India; capital, B.; fortress, temples; area, 1946 sq. miles. Pop. (1911) 165,496.

BANTAM.—(1) (6° 7' S., 106° 10' E.) residency forming western extremity, island of Java; majority of inhabitants Sudanese; rice, coffee. (2) town and seaport, founded by Dutch, 1595; formerly head of residency; unhealthy; gave name to B. fowls.

BANTING, BANTING (*Bos sondaicus*), wild ox of Java, Bali, and Borneo.

BANTRY (51° 41' N., 9° 27' W.), seaport town, County Cork, Ireland; fisheries, tweeds; scene of Fr. and Jacobean attempt to land, May 1, 1689 (battle of Bantry Bay). Pop. 3109.

BANTU ('men'), generic name for the language, with its many dialects, spoken by the native tribes occupying a large part of Africa south of the equator; also applied to tribes themselves.

Dr. Bleek's *Comparative Grammar of South African Languages* (1869); Father Torrend's *Comparative Grammar of the Bantu Languages* (1894); Stow, *Native Races of S. Africa*.

BANVILLE, THÉODORE DE (1823–91), Fr. poet and miscellaneous writer; s. of naval captain; devoted himself from his early years to lit. and journalism; pub. many vol's of verse of high quality,

and had several plays produced at the *Théâtre Français*; a leader of Parnassian school.

BANYAN (*Ficus bengalensis*), Indian tree of fig genus. '*B. Daya*' in Brit. navy meant days when no flesh was received with rations; derived either from b. or from Banian (q.v.), whom sailors might consider types of asceticism.

BANYULS-SUR-MER (42° 40' N., 3° 6' E.), summer resort, France. Pop. 3111.

BANYUMAS, BANJOEMAS (7° 32' S., 109° 20' E.), town and residency, Java. Pop. of town, 5302; of residency, 1,251,963.

BANYUWANGI (8° 19' S., 114° 20' E.), port, Java. Pop. 16,198.

BANZAI (—a thousand years), Jap. greeting.

BAOBAB, MONKEY BREAD, African tree; one of the largest known; its trunk sometimes measures upwards of 30 ft. in diameter; it produces a fruit, and the wood is very soft.

BAPAUNE (50° 6' N., 2° 51' E.), town, France; site of battle, 1871. Pop. 3113.

BAPHOMET, idol which Templars (q.v.) were accused of worshipping before dissolution of their order.

BAPTISM, the rite of immersion or sprinkling with water which constitutes admission into the Christian Church. It has parallels in various ancient religions, and was observed in later Judaism in the time of Christ. John the Baptist baptized those who came to him in the Jordan, and from the earliest times b. was essential in the Christian Church, for Jesus Himself was baptized by John. The command to baptize all nations is in *Matthew 28*¹⁹. The authenticity of the Trinitarian formula has been questioned, as there is some reason for thinking that b. simply into the name of Christ was the primitive custom.

The earliest account of Christian b. is in the *Didache* (Teaching of the Twelve Apostles). The custom of infant b. came in only by degrees; with many there was rather a tendency to delay it as much as possible, as all sin was forgiven at b. Those who sinned after b. found it difficult to get readmission into the Church. Constantine was only baptized on his death-bed. Those who were undergoing instruction for b. were called *Catechumens*, and the same term is used in the mission field to-day. Total immersion was the primitive custom (it is now only observed by Baptists), but sprinkling of water on the forehead is now usual. According to Catholic doctrine b. to be valid must be with water and in the threefold name, but can be performed by any one, though of course should be normally by a priest (thus still valid performed by a woman, 'heretic,' or even pagan). There has been much controversy whether infants dying unbaptized are damned. B. is observed by all Christians except the Quakers, and infant b. is the rule. Baptismal regeneration is a Catholic as opposed to a Prot. doctrine, i.e. it not only symbolises the removal of sin but sacramentally effectuates it, and this seems to be the New Testament view. The sacrament of b., too, is done once for all, and can never be repeated. Amongst Nonconformists b. is somewhat falling into disuse.

Darwell Stone, *Baptism*; liturgies, etc.

Baptistery (Lat. *baptisterium*), the chapel or building annexed to a church and specially designed for baptism; when baptism was by immersion and only took place three times a year, large b's were necessary; famous examples at Florence, Pisa, Asti, etc.

BAPTIST CHURCH, see under **FRANK CHURCHES**.

BAPTISTE, JEAN, name applied to Fr. Canadians.

BAPTISTE, NICOLAS ANSELME (1761–1835), Fr. actor; member of a family all the members of which achieved success on the stage.

BAR (49° N., 27° 55' E.), fortified town, Podolia, Russia. Pop. 10,614.

BAR, name in heraldry for horizontal stripe not more than fifth of field in breadth crossing field not in chief or fesse; *Bar sinister*, see **BARON**.

BAR, CONFEDERATION OF, formed by Polish nobles at Bar (1768) to oppose Russ. aggression in the person of her representative, Prince Repnin.

BAR, THE.—(1) Division in a court of law: in the higher courts K.C.'s are admitted within the b., other legal members sit outside. (2) The dock wherein the prisoner stands in criminal cases, hence the form of address, 'prisoner at the bar.' (3) A railed space in the Houses of Parliament, known as the 'bar of the House.' To be 'called to the Bar' in England is when one of the Inns of Court summons a student in law, and he thus becomes a barrister.

BAR HARBOR (44° 20' N., 68° 15' W.), summer resort, Hancock County, Maine, U.S.A.

BARA, warlike people of southern Madagascar.

BARA BANKI (26° 56' N., 81° 13' E.), town and district, United Provinces, India; wheat; area 1758 sq. miles. Pop. 1,170,323.

BARABA STEPPE (c. 54° 30' N., 78° E.), steppe region, Tomsk, Russia in Asia.

BARABBAS, Biblical character; imprisoned for murder, but chosen by Jews to be saved when Pilate offered them choice between B. and Jesus; illustrates popular injustice.

BARABOO (43° 28' N., 89° 45' W.), city, Wisconsin, U.S.A.; woollen factories. Pop. (1910) 6324.

BARABRA, name given to the Nubian dwellers in the Egyptian Sudan.

BARACALDO (43° 17' N., 2° 56' W.), port, on Nervion, Biscay, Spain; iron, dynamite. Pop. 15,000.

BARACOA (20° 23' N., 74° 21' W.), seaport, Cuba; oldest Span. settlement in Cuba (1512). Pop. 5600.

BARAGUAY D'HILLIERS.—(1) Louis (1764-1812), Fr. general, distinguished under Napoleon. (2) Achille, his s. (1795-1878), Fr. marshal, was distinguished in Crimean, Italian, and Franco-Prussian Wars.

BARAHONA DE SOTO, LUIS (1535-95), Span. poet; author of the *Primera parte de la Angélica* (1586). His work was highly praised by Cervantes.

BARANTE, AMABLE GUILLAUME PROSPER BRUGIÈRE, BARON DE (1782-1866), Fr. statesman and author; held various public offices under Napoleon and Louis Philippe; pub. *Histoire des ducs de Bourgogne de la Maison de Valois* (1824-28); trans. works of Schiller, and Shakespeare's *Hamlet*.

BARASAT (22° 43' N., 88° 32' E.), town, Twenty-four Parganas, Bengal, India. Pop. 8600.

BARATIER, JOHANN PHILIPP (1721-40), Ger. scholar; famous for precocious ability; proficient in Fr., Dutch, Lat., Gk., and Hebrew languages; Master of Arts (Halle) at age of fourteen.

BARATIERI, ORESTE (1841-1901), Ital. general; fought under Garibaldi; distinguished until 1896, when after defeat by Abyssinians, he was tried by military court and resigned.

BARATYNSKI, JEVGENI ABRAMOVICH (1800-44), Russ. poet; early life of adventure; wrote much-road *Eda* and *The Gipsy*.

BARB, backward arrow points; Moorish breed of horses; breed of pigeons; linen band about neck and chin worn by nuns; mucous membrane under tongue of horses and cattle; fleshy appendages on mouth of barbel; a leaf of heraldic rose.

BARBACENA (21° 11' S., 43° 44' W.), town, Brazil; health resort; cheese, cattle. Pop. c. 10,000.

BARBADOS, BARBADOWS (13° 5' N., 59° 36' W.), most easterly of Brit. W. Indian Islands; length, 21 miles; width, 14 miles; area, 166 sq. miles; exports sugar, molasses, rum, hides, tamarinds, aloes, chemicals, whale oil; imports coal, machinery, timber, rice, flour, etc.; administered by Gov., Executive and Legislative Councils, and Representative Assembly; chief town, Bridgetown; government system of education; nine-tenths of inhabitants negroes; climate hot; has belonged to Britain since 1605. Pop. (1911) 171,982.

BARBARA, ST. (fl. III. cent.), Christian martyr;

legendary connection with thunder-storms made her patron of artillery; feast, Dec. 4.

BARBARIANS, term used by Greeks to describe all non-Greeks, probably from 'bar-bar,' the sounds their language seemed; later Romans applied it to those beyond pale of their civilisation.

BARBAROSSA, see **FREDERICK I.**

BARBAROSSA, HORUK and KHAIR ED-DIN, Turkish corsairs; Horuk was captured and beheaded by the Spaniards, at Oran (1518). The younger bro. captured Algiers (1519), Tunis (1533), and became admiral of Turk. fleet under Solymán II. (1536). From that year until his death (1546) he was known as 'the scourge of the Mediterranean,' and the inveterate foe of all Christians. B. means red-beard.

BARBAROUX, CHARLES JEAN MARIE (1767-94), Fr. revolutionist; of the Girondist faction; boldly opposed Marat and Robespierre, and was by them denounced as an enemy of the republic; guillotined at Bordeaux.

BARBARY, former name for region of Northern Africa, inhabited by Berbers, and including Morocco, Algeria, Tunisia, and Tripoli.

BARBARY APE (*Macacus leucos*), is tailless, gregarious; inhabits Algeria, Morocco, and Gibraltar Rock.

BARBARY PIRATES, see under **THEFT**.

BARBASTELLE, bat found in England and elsewhere, with thick beard and hairs tipped with yellow.

BARBASTRO (41° 56' N., 0° 9' E.), town of Aragon, Spain; formerly seat of Cortes of Aragon. Pop. 7033.

BARBAULD, ANNA LETITIA (1743-1826), Eng. poetess; dau. of Dr. John Aikin (q.v.); m. Rochemont B.; wrote *Hymns in Praise for Children*; edit. letters of Samuel Richardson, etc.

BARBAZAN, capital, Fr. canton, Haute-Garonne arr. of Saint-Gaudens; mineral springs.

BARBAZAN, ARNAULD GUILLAUME DE (1360-1431), Fr. general; called *Chevalier sans reproche*.

BARBECUE (also *bracan*), Span. buccaneer term for a wooden framework, placed over a fire, on which meat was preserved by smoking; open-air feast at which animals were roasted whole.

BARBED WIRE, strands of wire twisted together and armed with short projecting spikes; invented in America, about 1867, where there was a great need of inexpensive cattle-fencing. The barbs were found very effective in preventing the cattle rubbing against the wire, and so damaging it. It is also used as modern method of fortification in war and as private police measure; by B. W. Act, 1893, placing of b. w. is responsible for damage done to persons not trespassing.

BARBEL (*Barbus vulgaris*), fish of Cyprinid family.

BARBÉ-MARBOIS, FRANÇOIS, MARQUIS DE (1745-1837), Fr. politician; eulogised Napoleon, whom he indifferently served, and was made a peer by Louis XVIII.; pub. *Réflexions sur la colonie de Saint-Domingue* (1794); *La Guyane* (1822); and other works.

BARBER (Lat. *barba*, beard), trimmer of beards; Eng. b's were incorporated in 1461 by Edward IV.; they were joined to the Surgeons' Company by Henry VIII., but their operations, apart from beard-trimming, were confined to blood-letting and extraction of teeth; in 1745 George II. gave the b's a separate corporation, but barber's sign, the pole, may still sometimes be seen accompanied by the surgeon's basin. B.'s shop, a place of gossip in Horace's time, remained so until days of daily postman and newspaper; *B. of Seville*, comic opera, masterpiece of Rossini.

BARBERINI, powerful Ital. family settled in Florence since XI. cent. Maffeo B. became Pope Urban VIII. (1623), and several of his relatives were made cardinals; magnificent B. palace and library (Rome) were founded by them.

BARBERRY (*Berberis vulgaris*), shrub of order Berberidaceae, with edible berries.

BARBERTON (25° 55' S., 31° 10' E.), town, Transvaal, S. Africa; goldfields.

BARBES, ARMAND (1810-70), Fr. politician and revolutionary; called *le Bayard de la démocratie*.

BARBETTE (Fr.), protected platform for artillery, either in a fortification or battleship.

BARBEY D'AUREVILLE, JULES AMÉDÉE (1808-89), Fr. novelist; noted for his handling of criminology; pub. *Une Vieille Maîtresse* (1851); *L'Ensorcelée* (1854); *Chevalier Destouches* (1864); *Les Diaboliques* (1874).

BARBEZIEUX (45° 28' N., 0° 9' W.), town, Charente, France.

BARBICAN, an outwork, or gateway-tower, to protect a drawbridge. The places bearing this name in London, Plymouth, and other towns mark the sites of such defensive buildings.

BARBIER, ANTOINE ALEXANDRE (1765-1825), Fr. librarian; discovered the Fénelon MSS.; was librarian under the Directoire, Conseil d'Etat, and Napoleon, and had a large share in the foundation of the great libraries at the Louvre, Fontainebleau, and elsewhere.

BARBIER, HENRI AUGUSTE (1805-82), Fr. satirical poet; pub. metrical trans. of Shakespeare's *Julius Caesar* (1848), and collaborated with de Wailly in the libretto of Berlioz's *Benvenuto Cellini*; best known for his satires, *Lambs* (1831).

BARBITON, ancient stringed musical instrument, familiar by name to readers of classics, and believed to be of Persian origin; it was shaped something like a lute.

BARBIZON (48° 25' N., 2° 35' E.), village, borders of forest of Fontainebleau, France; home of Millet; gave name to Barbizon School of landscape painters, founded by Rousseau, Millet, Corot, Dupré, Daubigny, and others.

BARBOU, Fr. family of famous printers. JOHN B. established press at Lyons in early XVI. cent.; they ultimately removed to Paris, and sold business (1808) to firm of Delalain.

BARBOUR, JOHN (1316-95), Scot. poet; regarded as father of Scot. poetry; archdeacon of Aberdeen; wrote a narrative poem, *The Brus*, in twenty books, and upwards of 13,000 lines, for which he received from King Robert II., in 1377, a gift of £10, and in following year a perpetual annuity of twenty shillings. *The Brus* was first printed at Edinburgh in 1571.

BARBUDA (17° 40' N., 61° 50' W.), island, Leeward group, Brit. W. Indies; cattle.

BARBUS, see CARPA.

BARBY (51° 59' N., 11° 53' E.), town, Saxony, Prussia; sugar factories. Pop. 5200.

BARCA, Carthaginian family. See HAMILCAR, HANNIBAL.

BARCA, ancient city, Cyrenaica, N. Africa; modern Merj.

BARCAROLLE, a class of song peculiar to Venetian gondoliers, with a simple, swinging measure; hence it has become name for similar sort of musical composition, used by Mendelssohn, Chopin, and others.

BARCELLONA (38° 7' N., 15° 10' E.), town, Sicily. Pop. (commune) 23,493.

BARCELONA.—(1) (41° 22' N., 2° 11' E.) seaport, N.E. Spain, on the Mediterranean; most important industrial centre in Spain and second seaport; good harbour; univ.; the *Rambla* is one of the finest promenades in Europe; fine cathedral; most important industry is cotton-spinning and weaving; also soap and glycerine factories, tanneries, etc.; chief exports, almonds, saffron, olive oil, wines. Pop. (1910) c. 560,000. (2) (41° 23' N., 2° 9' E.) province, Catalonia, Spain; mountainous, well-wooded; cotton manufactures; area, 2968 sq. miles. Pop. (1910) 1,133,900. (3) (10° 4' N., 64° 48' W.) capital, Bermudez, Venezuela; declining trade. Pop. 13,000.

BARCELONETTE (44° 25' N., 6° 35' E.), town, Basses-Alpes, France; marble.

BARCLAY, ALEXANDER (1475-1552), Scot. poet; held preferments at Ottery St. Mary, All Hallows, Lombard Street, and at Croydon. He wrote eclogues, but is chiefly known for his free trans. of Sebastian

Brant's *Ship of Fools*, written in Chaucerian stanzas, in which he lashes the sins and follies of his time.

BARCLAY, JOHN (1582-1621), Scot. satirist; lived chiefly in London and France; pub. *Sylvae*, collection of Latin poems (London, 1606); other works were *Satyricon*, a satire on the Jesuits, and *Argenis*, a fanciful romance in the style of Sidney's *Arcadis*.

BARCLAY, JOHN (1734-98), Scot. Presbyterian minister; founded Berean or Barclayite sect.

BARCLAY, JOHN (1758-1826), Scot. surgeon and author; anatomical collection nucleus of Barcleian Museum, Edinburgh.

BARCLAY, ROBERT (1648-90), Scot. Quaker; gov. of East New Jersey; his chief work was *An Apology for the True Christian Divinity*, pub. in Latin (Amsterdam, 1676), trans. into Eng., 1678.

BARCLAY DE TOLLY, MICHAEL (1760-1818), Russ. field-marshal; Minister of War, 1810, commander-in-chief of western army, 1812, and of whole Russ. army at Dresden, Kulm, Leipzig, and Paris, 1813-14; Count (1815).

BARCLAY-ALLARDYCE, ROBERT (1779-1854), noted pedestrian; walked 1000 miles in 1000 consecutive hours, 1809.

BARCOCHEBAS, or BAR-COCHBA, led Jewish rebellion against Rome, 132-135 A.D.

BARD, name for Celtic poet, who enjoyed special social rank; later applied to verse-writers in general. As national minstrels they flourished in Early Gaul and Britain, and their primitive office has been revived in Wales. The Welsh b's were exempt from taxes and military service, and up to the time of Elizabeth, bardic gatherings (*Eisteddfodau*) were summoned by royal authority. The modern revival began c. 1822.

BARDAISAN, BARDESANES (154-222 A.D.), early Christian teacher; b. Edessa, Mesopotamia; author of numerous religious writings, all of which are lost, with the exception of the *Hymn of the Soul* contained in the apocryphal *Acts of Thomas*.

BARDILL, CHRISTOPH GOTTFRIED (1761-1808), Ger. philosopher; pub. *Grundriss der ersten Logik* (1800), *Briefe über den Ursprung der Metaphysik*, etc.

BARDOWIEK (53° 16' N., 10° 20' E.), town, Hanover, Prussia.

BARDSEY (52° 45' N., 4° 48' W.), 'bard's island,' N. point Cardigan Bay, Wales; legendary last retreat of Welsh bards; farming and fishing; lighthouse.

BARDWAN, see BURDWAN.

BARBONE, PRAISE-GOD, BARBON (d. 1680), Eng. tradesman; Baptist preacher, and later Fifth Monarchy man (q.v.); sat as representative of the City of London in Cromwell's Parliament of nominees (1653), which was derisively called after him 'Barbone's Parliament'; was an active opponent of the Restoration.

BAREFOOTED RELIGIOUS ORDERS, DISCALCED ORDERS, include those who went literally barefoot, such as the Alcantarine branch (before 1897) of the Franciscan Order, and those who wear sandals, such as Franciscans generally, with the Colettines and Capuchin sisters, the Camaldolese, Discalced Carmelites, Passionists, and branches of the Cistercians, Augustinians, and Servites.

BARÈGES (42° 54' N., 0° 6' E.), village, Hautes-Pyrénées, France; sulphurous springs.

BARILLY, BARLI (28° 26' N., 79° 33' E.), city and capital, B. district, United Provinces, Brit. India; Mutiny of 1857 first broke out here; Government Coll., mosques, citadel; manufactures furniture. Pop. (1911) 126,462. District area, 1580 sq. miles. Pop. 1,090,117.

BARENTIN (49° 35' N., 0° 55' E.), town, Seine-Inférieure, France; cotton. Pop. 5600.

BARENTS SEA (76° 10' N., 40° E.), part of Arctic Ocean, between Novaya Zemlya, Spitzbergen, and mainland.

BARENTS, WILLEM (d. 1597), Dutch navigator; conducted three unsuccessful expeditions from Holland

in search of a N.E. passage to Asia (1594-97). On the third voyage he discovered Spitzbergen, rounded Novaya Zemlya, where he was compelled to winter, and there died. In 1871 his camp and relics were discovered, and in 1875 a portion of his Journal was found; *Barents' Voyages*, trans. and pub. by Hakluyt Socy., 1876.

BARÈRE DE VIEUZAC, BERTRAND (1755-1841), Fr. revolutionist; s. of a Gascon lawyer; became deputy to National Assembly (1789), delegate from Hautes-Pyrénées to National Convention (1792), and a member of Committee of Public Safety. Voting first with the Girondists, he bitterly attacked Robespierre, but later joined his party and soothed his resentment by flattery. He voted for death of the king, proposing that 'terror should be the order of the day.' Later he was imprisoned and disgraced.

BARETTI, GIUSEPPE MARC' ANTONIO (1719-89), Ital. critic; settled in London, and was associated with Dr. Johnson and the Thrales (*Boswell's Life*); wrote on Shakespeare and other authors, and compiled a *Dictionary and Grammar of the Italian Language*.

BARFLEUR (49° 41' N., 1° 16' W.), ancient seaport, Manche, France; highest Fr. lighthouse at Cape B.; *White Ship* wrecked outside harbour, 1120.

BARFURUSH, BALFRUSH (36° 32' N., 62° 43' E.), town, Mazandarin, Persia; important commercial centre; colleges, bazaars; rice, cotton. Pop. 60,000.

BARGA PASS, much-used pass over Himalayas, Bashahr State, Punjab.

BARGAIN AND SALE, legal term for a contract by which real or personal property is transferred from one individual to another.

BARGE (44° 42' N., 7° 18' E.), town, Italy; slate quarries. Pop. 9319.

BARGE, flat-bottomed boat used on canals, and towed by a horse; on tidal waters they are sometimes fitted with sails; a 'lighter,' boat used for loading or unloading vessels; stationary house-boat like the Oxford College b's on the Isis; in earlier times a highly-decorated craft used by kings and nobles.

BARGEBOARD, a piece of board, often ornamented, covering the roof timbers of a gable.

BARGHEST, BARGUEST, spectre hound in N. Eng. folk-lore.

BARHAM, RICHARD HARRIS, 'THOMAS INGOLDSBY' (1788-1845), Eng. humorist; ed. St. Paul's School and Brasenose Coll., Oxford; clergyman and minor canon of St. Paul's; acquired (1837 onwards) lasting fame by his *Ingoldsby Legends*, combining humour with deep scholarship.

BAR-HEBRÆUS, see ABUL-FARAJ.

BARI (41° 7' N., 16° 49' E.), seaport, capital of B. province, Apulia, Italy; sbp.'s seat; pilgrim church, St. Nicola, founded 1027; nautical school; olive oil, soap. Pop. (1911) 103,522. Province area, 2065 sq. miles. Pop. (1911) 892,417.

BARILI (10° 10' N., 123° 30' E.), town, Cebu, Philippine Islands; Ind. corn.

BARILLA, an impure carbonate of soda obtained by burning plants grown in salt marshes or on sea-coast; formerly widely used method, but abandoned now that the carbonate is obtained from salt.

BARING, family of Eng. financiers and bankers; firm of Baring Bros. (1770-1890), 1st banking-house in Europe; members of the family have been prominent *statesmen*, and obtained respectively baronies of Ashburton, Northbrook (afterwards made an earldom), Revelstoke, and earldom of Cromer (*q.v.*).

BARING-GOULD, REV. SABINE (1834-), Eng. author and clergyman; writer of numerous novels, hymns, religious and antiquarian works.

BARINGO (0° 40' N., 36° 10' E.), lake, Central Africa; no outlet; discovered, 1883.

BARISAL (22° 50' N., 90° 20' E.), town, Dacca, Bengal, India. Pop. 19,000.

BARITONE, male voice of light bass character; an intermediate range between tenor and bass.

BARIUM (Ba = 137.37), metallic element belonging to alkaline earths; difficult to isolate; of silver lustre, oxidises readily, reacts with water and alcohol; occurs chiefly as barytes, witherite, baryto-calcite, baryto-celestine, and in complex silicates; spectrum shows two characteristic green lines.

BARKER, EDMUND HENRY (1788-1839), Eng. scholar; edited classics.

BARKER, HARLEY GRANVILLE (1877-), Eng. actor-manager and playwright; fosters the 'new' drama plays; wrote *Voysey Inheritance* (1905), *Waste* (1910), etc.

BARKER, ROBERT (1739-1800), Irish artist associated with Edinburgh.

BARKER'S MILL, engine, named after inventor, worked by pressure of water instead of that of steam.

BARKING (51° 33' N., 0° 5' E.), market town, Essex, England; ruined abbey; factories. Pop. (1911) 31,302.

BARKLY EAST (30° 58' S., 27° 39' E.), town, Cape Province, S. Africa; sheep farming.

BARKLY WEST (28° 30' S., 24° 35' E.), town, Cape Province, S. Africa; diamonds.

BARKLY, SIR HENRY (1815-98), Brit. governor of Brit. Guiana, Jamaica, Victoria, Mauritius, and Cape, successively (1848-77).

BARLAAM AND JOSAPHAT, Christianised mediæval romance of Buddhist origin.

BAR-LE-DUC (48° 47' N., 5° 10' E.), town, on Orain, Meuse, France; was capital of mediæval county, afterwards Duchy, of Bar; birthplace of great Duke of Guise and Marshal Oudinot. Pop. 17,700.

BARLETTA (41° 19' N., 16° 15' E.), seaport town, Bari, Italy; tartaric acid. Pop. (1911) 42,964.

BARLEY (*Hordeum sativum*), important hardy cereal including numerous sub-species, cultivated from ancient times in temperate regions for domestic cookery, malting, and brewing. Under fair conditions one peck may yield about 4½ bushels (each 56 lb.). B. is liable to same parasitic diseases as wheat. Of the three varieties (*H. distichum*, *H. hexastichum*, i.e. two-rowed and six-rowed, and *H. vulgare*, or common, which is four-rowed), first is best for brewing, while second is thought scarcely worth while cultivating. Decorative character recognised by ancients; Romans used it as adornment on coins of corn-goddess Ceres. Barley-corn, formerly barley-grains, a measure of length; malt liquor, personified in Burns' song, 'John B.'—Barley sugar, sweetmeat made of sugar and b. water.

BARLEY-BREAK, old Eng. country game, played by three persons of each sex in couples, placed in three positions close to one another, the middle couple trying to catch the others, who, when caught, were put in the middle position, or *hell*.

BARLOW, JOEL (1754-1812), Amer. poet and politician; wrote for Girondists in France, 1789-91, for Whigs in England, and in 1807, *The Columbiad*, epic poem.

BARLOW, PETER (1776-1862), Eng. mathematician; Prof. of Mathematics, Royal Military Academy, Woolwich; improved mariner's compass, the telescope, and encouraged steam locomotion.

BARLOW, SIR THOMAS (1845-), Bart. (cr. 1901), physician-extraordinary to Queen Victoria and Edward VII.; pres. of Roy. Coll. of Physicians, 1910.

BARM, yeast (*q.v.*); scum on fermenting malt liquor.

BARMECIDES, Persian family founded by Barmak; appear in *Arabian Nights*, where is account of B. Feast, banquet of imaginary dishes served to a beggar whose sense of humour allowed him to pretend to eat them, become uproarious on visionary wine, and win his entertainer's goodwill by giving him a box on the ear.

BARMEN (51° 17' N., 7° 11' E.), town, Düsseldorf district, Germany; ribbons. Pop. (1911) 169,201.

BARMOUTH (52° 44' N., 4° 3' W.), summer resort, Cardigan Bay, Merionethshire, N. Wales.

BARNABAS (=Son of Consolation, so called by the Apostles), the Apostle, was a Levite of Cyprus

named **Joses**, who sold his land and gave the money to the Apostles. He was the uncle of Mark. B. championed Paul, after the latter's conversion; was sent to Antioch; accompanied Paul on his first missionary journey; returned to Antioch and sailed with Mark to Cyprus, where he is said to have d. as a martyr. The apocryphal *Epistle of B.* is found in the *Codex Sinaiticus*, and Clement of Alexandria (200) frequently quotes it and attributes it to B. It deals with the attitude of the Church towards the Jewish Law, in an anti-Judaistic spirit. Harnack gives its date as about 130.

BARNABITES, religious order of 'Regular Clerks of St. Paul,' founded in Milan, 1530; named from place of assembly, church of St. Barnabas.

BARNACLE, see *THYROSTRACA*.

BARNARD CASTLE (54° 33' N., 1° 55' W.), market town, on Tees, Durham County, England; ruins of Castle Barnard; birthplace of John Balian; scene of Scott's *Rokeby*; flax thread. Pop. (1911) 4757.

BARNARD, LADY ANNE (1760-1825), Scot. poetess; dau. of 5th Earl of Balcarras; m. Andrew B., who was app. colonial sec. at Cape of Good Hope. She is chiefly remembered for her ballad, *Auld Robin Gray*, written 1772 (pub. anonymously, 1783; authorship admitted to Sir W. Scott, 1823), and her *Letters* from the Cape.

BARNARD, FREDERICK AUGUSTUS PORTER (1809-89), Amer. educationist and scientist; associated with development of Columbia Univ., and with admission of women to univ's.

BARNARD, GEORGE GREY (1863-), Amer. sculptor; has executed many subject studies, including *Two Natures* (Metropolitan Museum, New York).

BARNARD, HENRY (1811-1900), Amer. educationist; first U.S.A. education commissioner; instituted Bureau of Education.

BARNARDO, THOMAS JOHN (1845-1905), Irish philanthropist; opened 'Dr. B.'s Home,' at Stepney, 1867, to shelter and train homeless children; and afterwards established 111 similar refuges, besides village at Barking-side for girls.

BARNATO, BARNETT ISAACS (1852-97), S. African diamond merchant.

BARNAUL (53° 20' N., 83° 48' E), town, Tomsk, Asiatic Russia; smelting furnaces. Pop. 29,408.

BARNAVE, ANTOINE PIERRE JOSEPH MARIE (1761-93), orator of Fr. Revolution, most distinguished after Mirabeau; among first to oppose monarchy; escorted king back from Varennes; but opposed touching king's person; executed for having advised Louis XVI. to veto bills.

BARNBURNERS, Amer. democratic party, so named (c. 1844) from drastic measures advocated.

BARNBY, SIR JOSEPH (1838-96), Eng. composer and conductor; head of Guildhall School of Music (1892); his works include *Rebekah*, an oratorio, anthems, part-songs, about 250 hymn-tunes.

BARNES, ALBERT (1798-1870), Amer. Presbyterian theologian; eloquent preacher and popular expositor of Scriptures.

BARNES, BARNABE (1569-1609), Eng. poet; pub. two plays, *The Devil's Charter* and *The Battle of Evesham*; also *Parthenophil* (odes, elegies, etc.) and *A Divine Century of Spirituall Sonnets*.

BARNES, SIR EDWARD (1776-1838), Eng. general and gov. of Ceylon.

BARNES, THOMAS (1785-1841), Eng. journalist; followed Dr. Stoddart as editor of *The Times* (1817); intimate with Lamb, Hazlitt, and others.

BARNES, WILLIAM (1801-86), Eng. poet and philologist; s. of farmer; was successively lawyer's clerk, schoolmaster, and clergyman; pub. *Poems in the Dorset Dialect* (1844); *Ilwomely Rhymes* (1858); *Collected Poems* (1879); *Philological Grammar* (1854); *Glossary of Dorset Dialect* (1863), etc. B. seems to have been a man of singular sweetness of character, and his poems of Dorset life have secured a firm place in modern Eng. lit.

BARNET (51° 37' N., 0° 12' W.), district, Herts,

England; on Great North Road; great fair still held; scene of battle (1471) in Wars of Roses, where 'King-maker' fell; obelisk erected, 1740. Pop. 10,440.

BARNETT, JOHN (1802-90), Eng. composer; b. Bedford; s. of Prussian jeweller who assumed Eng. name; sang on stage as boy, and received musical training; father of modern Eng. opera; *Mountain Sylph* (1834) well received at Lyceum; followed by *Fair Rosamond* (1837) and *Farinelli* (1839).

BARNETT, SAMUEL AUGUSTUS (1844-1913), Eng. clergyman and social reformer; Steward of Westminster; noted for Church work among Whitechapel poor; promoted Univ. Extension; first warden of Toynbee Hall; pub. *Practicable Socialism* (1888).

BARNEVELDT, JAN VAN OLDEN (1547-1619), Dutch patriot and statesman; b. Utrecht; advocate-general, 1515; opposed warlike policy of Maurice of Nassau; proposed religious toleration, but as Remonstrant (follower of Jacobus Arminius, q.v.) was beheaded for treason. *Life*, by Motley.

BARNFIELD, RICHARD (1574-1627), Eng. poet; ed. Brazenose Coll., Oxford; pub. *The Affectionate Shepherd* (1594); *Cynthia, with certain Sonnets* (1595); *Lady Pecunia* (1598); and *The Passionate Pilgrim* (1599). The latter work bore Shakespeare's name on title-page, but later researches have proved it to be largely the production of B.

BARNIM (52° N., 13° 20' E.), district, Brandenburg, Prussia, embracing Berlin.

BARNLEY, BLEAK B. (53° 34' N., 1° 28' W.), market town, parliamentary and municipal borough, on Dearne, Yorkshire; coal-fields; iron and steel; linen. Pop. (1911) 50,623.

BARNSTABLE (41° 44' N., 70° 14' W.), seaport town, Massachusetts, U.S.A. Pop. (1910) 4876.

BARNSTAPLE (51° 1' N., 4° 5' W.), seaport, Devonshire, England; municipal, parliamentary, and ancient royal borough; XII.-cent. bridge over river Taw; mediæval church and grammar school; ship-building, lace, pottery. Pop. (1911) 14,488.

BARNUM, PHINEAS TAYLOR (1810-91), Amer. showman; successfully toured with the dwarf, 'General Tom Thumb,' in U.S.A. and England (1842-44), and introduced Jenny Lind to the Amer. public. In 1871 he launched enterprise known as 'The Greatest Show on Earth,' with which he toured world.

BAROCCHIO, GIACOMO (1567-73), Ital. architect; under the patronage of Pope Julius III. he succeeded Michael Angelo as the architect of St. Peter's (1564), and designed numerous other buildings in Rome; pub. *Five Orders of Architecture* (1663), and *Practical Perspective* (1583).

BARODA (23° N., 72° E.), native state, Gujarat, Bombay, India; ruled by Gaekwar under Brit. supervision; capital, B.; temples, colleges, cotton mills; area, 8099 sq. miles. Pop. (1911) 2,032,798.

BAROMETER, instrument for measuring atmospheric pressure. Galileo's observation that water ordinarily rises in a pump to a height of about 34 ft. induced Torricelli to prove experimentally that the atmosphere has weight. He demonstrated that mercury, filling a tube 3 ft. long sealed at one end, when inverted in a basin containing the same fluid, sank to a level of about 30 in. above that of the mercury, in the basin, a vacuum being left at the top of the tube. Subsequently, Pascal showed that the level of the mercury varied in different altitudes or in different weather, thus making Torricelli's appliance provided with a scale known as a *weather glass* and an instrument for determining altitudes. In the so-called *cistern* b. the mercury level in the basin naturally varies with the level in the tube, rendering the exact observation of different pressures difficult owing to this 'error of capacity.' This is obviated in the *Fortin* b. by a screw by means of which the mercury in the cistern can be adjusted to a standard level indicated by an ivory point. The obvious disadvantages of the mercury b. are avoided in the *aneroid* b., which consists of a thin metal box

from which the air has been evacuated, its shape changing with different pressures. Alterations are magnified by a system of levers, and indicated on a dial by a hand. *Barographs* are self-registering barometers.

Barometric Light, electric glow caused by friction between mercury and air in shaken barometer tube.

Marvin, Barometers and the Measurement of Atmospheric Pressure (1901).

BARON, in early times in England the word was used to distinguish a person who held lands of the sovereign, but was not in any sense a title. It was first employed as a title by Richard II., who in 1387 created John de Beauchamp b. of Kidderminster. Henry VI. was the first king to create a number of b's. Charles II. gave b's a coronet. The title, which is hereditary to the heirs-male, is the lowest in the peerage. The children of a b. are addressed as 'The Honourable.'

BARON AND FEMME, *FEME*, Norman words, meaning man and wife, used in Eng. law and heraldry.

BARON, MICHEL (1653-1729), Fr. actor; leading actor of his period; played in Molière's company, and created many principal rôles in Racine's tragedies.

BARONET, hereditary Brit. title instituted by James I., the first person thus or. being Sir Nicholas Bacon, knight (f. of Francis Bacon), who received the honour in 1611. A b. takes precedence of a knight, but not of the younger sons of barons. His wife is styled 'Dame,' but usually is called 'Lady.'

BARONIUS, CÆSAR (1538-1607), Ital. cardinal and historian; chiefly remembered as author of *Annales Ecclesiastici*.

BARONS, WAR OF THE, see ENGLAND (p. 549 D). **BARONY**, division of a county in Ireland, equivalent to an Eng. 'hundred' (q.v.).

BAROSS, GABOR (1848-92), Hungarian statesman and economic reformer.

BAROTAC NUEVO, town, Iloilo, Panay, Philippine Islands. Pop. 12,000.

BAROTSELAND (c. 15° 25' S., 25° E.), district, N.W. Rhodesia; inhabited by Bantu race.

BARQUE, see SHIP.

BARQUISIMETO (10° N., 69° W.), city, state of Lara, Venezuela; bp.'s seat; coffee. Pop. 31,000.

BARR (48° 24' N., 7° 22' E.), town, Alsace-Lorraine, Germany; wine, timber. Pop. 5,000.

BARRA, BARRAY (57° N., 7° 32' W.), island, Outer Hebrides, Inverness-shire, Scotland; fisheries.

BARRA MANZA, town on Parahiba, Brazil. Pop. 12,000.

BARRACKPUR (22° 45' N., 88° 20' E.), town, on Hughli, Bengal, India; mills. Pop. 32,000.

BARRACKS.—A standing army must be lodged apart from the civil population and the permanent buildings provided for them are called barracks: they are of various types and dimensions; many date from the XVIII. cent., others have been built of late years with more regard to modern ideas of comfort. The buildings are generally planned to form a quadrangle which is used as a drill ground. In the case of infantry each company appropriates a room, a floor, or a block, which is furnished by a branch of the Army Service Corps with tables, forms, beds, and boxes, a coal bin, and cleaning implements. The regimental kitchen is situated in a position convenient for all—

----- playing its own cook.
N.C.O.'s above the rank of corporal take their meals in common in a building called the sergeants' mess, which is also a recreation room. The officers occupy a separate block, which contains a reading-room, dining-room, billiard-room, kitchen, and bedrooms; this is known as the officers' quarters. Another building is appropriated to the married people, from private to sergeant-major; unmarried sergeants sleep in an anteroom used as the company office, and known as the 'bunk.' A building is also appropriated to the regimental staff, where the adjutant and the quartermaster, assisted by their clerks, prepare the correspondence, etc., for the lieutenant-colonel, who attends daily for the discharge of routine business.

There is a guard-house near the barrack gate, where refractory soldiers are confined. There is stable accommodation for chargers; also latrines and bath-houses. The troops obtain beer and other refreshments at a regimental shop familiarly known as the *canteen*. There is another building where coffee, soup, etc., may be obtained, and where indoor games may be played. There is also a gymnasium and sometimes a skittle-alley or miniature rifle range. In short, the barracks is a walled town in miniature, of which the inhabitants are soldiers and their families. In India the troops are accommodated in cantonments (from *canton*, a district) apart from the native inhabitants.

BARRACOUTA, 'BARRACUDA', fish of tropical and subtropical regions which attacks man.

BARRAFRANCA (37° 21' N., 14° 13' E.), town among mountains of Sicily. Pop. 11,068.

BARRANDE, JOACHIM (1799-1883), Austrian geologist; issued numerous papers on lower Palæozoic fossils, and a great work on Bohemian Silurian system.

BARRANQUILLA (11° N., 74° 55' W.), city and port, Magdalena river, Colombia. Pop. 48,907.

BARRANTES, VICENTE (1829-98), Span. author and politician, wrote poems, satires, history, etc.

BARRAS, PAUL FRANÇOIS NICOLAS, COMTE DE (1755-1829), Fr. statesman; member of Directory, 1795-99; corrupt and immoral; left notes for memoirs.

BARRATRY.—(1) Act of stirring up quarrels or breaches of the peace. (2) Fraudulent act by a master-mariner against the owner of his ship, or cargo, such as scuttling the ship, embezzlement, etc. (3) In Scots law, the crime of a judge who accepts bribery.

BARRE (44° 15' N., 72° 30' W.), city, Washington County, Vermont, U.S.A.; granite. Pop. (1910) 10,734.

BARRE, ISAAC (1726-1802), Brit. soldier of Fr. extraction; treasurer to navy, 1782.

BARREL-ORGAN, portable mechanical organ, played by turning a handle. This handle turns a wooden cylinder set with pins which raise the keys, thus admitting air from the wind-chest. Originally known as 'the Dutch organ,' the barrel-organ was first made in the Netherlands during the XV. cent. After its introduction into England it was frequently used in churches.

BARREN ISLAND (12° 6' N., 93° 45' E.), volcanic island, Bay of Bengal.

BARRES, MAURICE (b. 1862), Fr. author, politician, and academician; chief novel, *Les Déracinés*, sets forth political creed, as *Le Jardin de Bérénice* sets forth his Nietzschean philosophy.

BARRETT, ELIZABETH, see BROWNING.

BARRETT, LAWRENCE (1838-91), Amer. actor; noted for his performance of Shakespearean characters, and, after Edwin Booth, the leading 'legitimate' actor of his day in America; served with distinction during Civil War; wrote lives of Edwin Booth and Edwin Forrest.

BARRETT, LUCAS (1837-62), Eng. naturalist; director of Jamaica Geological Survey.

BARRETT, WILSON (1846-1904), Eng. actor and dramatist; excelled in melodrama; wrote *The Sign of the Cross* (1895) and other plays.

BARRHEAD (55° 48' N., 4° 23' W.), burgh and town, on Leven, Renfrewshire, Scotland; weaving, engineering. Pop. (1911) 11,387.

BARRIAS, FÉLIX JOSEPH (1822-1907), Fr. historical painter; his bro., LOUIS ERNEST (1841-1905), sculptor, has executed several public works at Paris.

BARRIAS, LOUIS ERNEST (1841-1905), Fr. sculptor; besides public monuments, has done groups on classical subjects, noted for strength and simplicity of handling.

BARRICADE (BARRICADO), improvised fortification to check hostile advance. *Barricades*, *Days of the (Journées des)*; raising b's is favourite Parisian way of commencing insurrection; chief—May 12, 1858, raised by League with view of deposing Henry III. in favour

of Duke of Guise; Aug. 27, 1648, first important manifesto of Fronde; during revolutions 1830, 1848, and 1871.

BARRIE (44° 23' N., 79° 43' W.), town, capital of Simcoe County, Ontario, Canada; summer resort; breweries. Pop. 6000.

BARRIE, SIR JAMES MATTHEW, Bart. (1860–), Scot. novelist and dramatist; b. Kirriemuir; made his reputation with sketches and novels of Scot. life, *A Window in Thrums* (1889), *The Little Minister* (1891), etc., and plays of a delicate fancy and whimsical satire, the most esteemed being *The Admirable Crichton* (1903), *Peter Pan* (1904), *What Every Woman Knows* (1908), *The Twelve-Pound Look* (1910).

BARRIER ACT, 1897, act of General Assembly of Scot. Church by which ecclesiastical bills must receive assent of presbyteries and General Assembly; named from forming b. to hasty legislation.

BARRIER REEF (c. 10° to 25° S., 144° to 152° 30' E.), chain of coral reefs outlining most of E. Queensland coast.

BARRIER TREATY (1709), treaty between England and United Netherlands, by which former guaranteed latter against Fr. aggression in return for guarantee against attack on Prot. succession in England.

BARRIERE, THEODORE (1823–77), Fr. dramatist; produced *La Vie de Bohème* (1849), *Manon Lescaut* (1861), *Les Faux Bonshommes*, *Le Gascon*, etc.

BARRILI, ANTONIO GIULIO (1836–1906), one of most popular Ital. novelists.

BARRING-OUT, act of rebellion amongst school-boys, which consisted of excluding the master from the school premises. A notable instance took place at Edinburgh High School (1895), when Bailie Macmorran was shot dead by one of the boys.

BARRINGTON, DAINES (1727–1800), Eng. lawyer and author; s. of 1st Viscount B.; pub. *Tracts on the Probability of Reaching the North Pole* (1775) and *Miscellanies on Various Subjects* (1781), including studies on the language of birds.

BARRINGTON, GEORGE, Irish actor; real name Waldron; having served several long terms of imprisonment for pocket-picking, etc., was transported to Botany Bay, and became High Constable of Paramatta; pub. *Voyage to Botany Bay* (1801) and *History of New South Wales* (1802).

BARRINGTON, JOHN SHUTE, 1st Viscount (1678–1734), Eng. lawyer, politician, and theologian.

BARRINGTON, SAMUEL (1729–1800), Brit. admiral; s. of 1st Viscount B.; distinguished in Seven Years War.

BARRINGTON, WILLIAM WILDMAN SHUTE, 2nd Viscount (1717–93), Eng. statesman; Chancellor of Exchequer, 1761.

BARRISTER, a legal practitioner qualified to plead in the higher law courts of England, who must be a member of one of the Inns of Court. It is necessary, in order to become a b., to pass a general examination, pay certain fees, and to keep twelve terms at one of the Inns, when, after further examination, it rests with the benchers of the Inn to call him to the Bar. When a barrister is made a King's Counsel (not less than 10 years after being called) he is said to 'take silk,' and is then debarred by etiquette from undertaking certain minor forms of legal work. In Scotland a b. is known by the title of advocate (*q.v.*), and must be a member of the Faculty of Advocates, to which he is admitted on examination and on payment of certain fees.

BARROS, JOÃO DE (1496–1570), Portug. historian; wrote a romance of chivalric age, the *Chronicle of the Emperor Clarimundo* (1516), but is chiefly renowned for his *Decades*, setting forth the history of the Portuguese in Asia; was a noted literary stylist.

BARROSA (36° 20' N., 6° 10' W.), town, Spain. British defeated French, 1811.

BARROT, CAMILLE HYACINTHE ODILON (1791–1873), Fr. politician; famous as an advocate; joined National Guard and took part in Revolution of

1830, also in that of 1848; became head of Louis Napoleon's first ministry; retired after the *coup d'état*, but returned to office again in 1872.

BARROW (52° 30' N., 0° 58' W.), river, Leinster, Ireland; joins Suir, Waterford harbour.

BARROW, ISAAC (1630–77), Eng. mathematician and divine; prof. of Greek in Cambridge; Gresham prof. of geometry; master of Trinity and vice-chancellor; author of numerous scientific works, his *Method of Tangents* influencing Newton's work.

BARROW, SIR JOHN (1764–1848), Eng. traveller and author; b. Ulverstone (Lancs); spent much time in China as sec. to Lord Macartney; held post of 2nd sec. to Admiralty for 40 years; pub. *Travels in S. Africa* (1801–83), *Travels in China* (1804), *Voyage to Cochín-China* (1806), and history of modern Arctic expeditions, 1818, 1846.

BARROWE, HENRY (d. 1593), Eng. Puritan; was intimately associated with John Greenwood, leader of the Separatists, whose views he adopted, and was, in 1588, cast into the Fleet Prison at the instance of Abp. Whitgift. Here he remained until he was condemned and hanged, the charge being that of circulating seditious books. He wrote *A Brief Discovery of the False Church* (1591) and other books promulgating Separatist opinions.

BARROW-IN-FURNESS (54° 7' N., 3° 14' W.), county borough and seaport town, on Morecambe Bay, Lancs, England; of modern and rapid development; in vicinity are extensive iron-ore mines; large manufactures iron and steel; magnificent docks; engineering; wagon works. Pop. (1911) 63,775.

BARROWS (A.S. *beorh*, 'a little hill'), sepulchral mounds which are found throughout Europe and in many other parts of the world. In the Brit. Isles they are either round or oval in shape, and are formed of a stone-built inner chamber covered with earth, or sometimes of earth alone. In other instances they consist entirely of stone, several uprights, supporting a huge capstone; these in England are known as *cromlechs*, and in Brittany as *dolmens*. Sometimes the human remains were burned, and the ashes deposited in urns, but often actual bodies were buried, together with arms, drinking-vessels, and domestic animals belonging to the deceased. The b's of the Viking age were frequently very large, and it seems to have been a common custom to bury a warrior aboard his ship. The Gokstad ship, discovered in a burial mound in 1880, and now in the Christiania museum, is 78 ft. long, while the b. also contained the remains of a dozen horses, besides numerous other animals, weapons, etc. Greenwell, *British Barrows* (1877).

BARROW-UPON-SOAR (52° 46' N., 1° 9' W.), village, Leicestershire, England; industries, stone and cement works, stocking manufacture.

BARRY (Fr. *barré*, barred), term in heraldry for field traversed by horizontal bars of different colours.

BARRY (51° 24' N., 3° 16' W.), seaport, Glamorgan-shire, S. Wales, opposite island of B., Bristol Channel; docks accommodate largest vessels afloat; enormous quantities of coal shipped. Pop. (1911) 33,767.

BARRY (56° 31' N., 2° 45' W.), village, Forfarshire, Scotland; annual military and territorial camp.

BARRY CORNWALL, see PROCTER, BRYAN WALLER.

BARRY, SIR CHARLES (1795–1860), Eng. architect; designed Houses of Parliament, Bridge-water House, and many churches and private mansions; also Royal Institution (1824) and Athenæum (1836) at Manchester; was knighted (1852); buried in Westminster Abbey.

BARRY, ELIZABETH (1658–1713), Eng. actress; won high praise from Dryden and Cibber, and was particularly famous for her performances in Otway's plays.

BARRY, JAMES, R.A. (1741–1806), Irish artist; b. Cork, where he received early art training; came to London, was patronised by Edmund Burke and others. He painted many large pictures, chiefly on hist. and

allegorical subjects, many of which were done for the great hall of the Soc. of Arts in the Adelphi.

BARRY, JEANNE BÉCU, COMTESSE DU (1741-93), mistress of Louis XV.; fled to England at outbreak of Revolution, but returned and was guillotined during Terror.

BARRY, SIR JOHN WOLFE WOLFE- (1836-), Eng. engineer; s. of Sir Charles B. (q.v.); assumed addition 'Wolfe' by licence, 1898; constructor of Tower Bridge, Blackfriars ry. bridge, and many other important works.

BARRY, SIR REDMOND (1813-80), Australian judge; did much to promote higher education in the colonies; founder and first Chancellor of Melbourne Univ. (1853).

BARRY, SPRANGER (1719-77), Irish actor; b. Dublin; in leading Shakespearean rôles became a rival of Garrick, over whom he possessed the advantage of a tall and handsome person. His second wife, *Ann Street Barry* (d. 1801), an actress, was considered the superior of Mrs. Siddons in some characters.

BARSI (18° 12' N., 75° 43' E.), town, Sholapur, Bombay Presidency, India. Pop. 24,000.

BAR-SUR-AUBE (48° 17' N., 4° 38' E.), district and town, Aube, France; flour. Pop. 4600.

BAR-SUR-SEINE (48° 0' N., 4° 19' E.), town, Aube, France; glass, brandy; French defeated Austrians, 1814. Pop. 3300.

BART, JEAN (1651-1702), Fr. naval officer; s. of a fisherman; b. Dunkirk; first served in Dutch navy under De Ruyter, later entered Fr. service; by sheer force of character and bravery rose to highest rank. He was no respecter of persons, and many stories of his blunt humour are recorded.

BARTAS, GUILLAUME DE SALLUSTE, SIEUR DU (1544-90), Fr. Huguenot; author of great religious epic poem, *La Semaine, ou Création du Monde*.

BARTAN, BARTIN (41° 39' N., 32° 19' E.), town and port; Kastamuni vilayet, Asiatic Turkey.

BARTELS, HANS VON (1856-), Ger. artist; chiefly known for his vigorous water-colours depicting storm scenes and incidents in the lives of fisher-folk.

BARTENSTEIN (54° 15' N., 20° 49' E.), town, on Alle, Prussia; carriage-building. Pop. 7071.

BARTET, assumed surname of **JEANNE JULIA RENAUDT** (1854-), prominent Fr. actress.

BARTH (54° 20' N., 12° 40' E.), seaport town, Pomerania, Prussia; shipbuilding. Pop. 7600.

BARTE, HEINRICH (1821-66), distinguished Ger. explorer and writer of books of travel; made observations on North and Central Africa for Brit. government, 1850-56.

BARTE, KASPAR VON (1587-1658), Ger. philologist; travelled extensively, and was a voluminous writer of great learning; his *Adversaria* (1624) is a mine of miscellaneous information.

BARTHELEMY, ANATOLE JEAN-BAPTISTE (1821-1904), Fr. numismatist; pub. *Nouveau manuel complet de numismatique ancienne* (1851) and a similar work on modern coinage (1853).

BARTHELEMY, AUGUSTE MARSEILLE (1790-1867), Fr. satirical poet; collaborated with J. P. A. Méry; trans. *Æneid* into verse; pub. *Les Sidiennes* (1825), *La Villulide* (1827), *La Corbiérède*, and other works.

BARTHELEMY, FRANÇOIS, MARQUIS DE (c. 1747-1830), Fr. diplomatist and politician under monarchy, empire, and restored monarchy.

BARTHELEMY SAINT-HILAIRE, JULES (1805-95), Fr. philosophical writer and republican statesman.

BARTHEZ, PAUL JOSEPH (1734-1806), Fr. physician; prof. of Med. and chancellor of univ. of Montpellier; author of *Science de l'homme*, trans. into many different languages.

BARTHOLDI, FRÉDÉRIC AUGUSTE (1834-1904), Fr. sculptor; Statue of *Liberty* (New York Harbour) and *Lion of Belfort* are among his works.

BARTHOLINUS, GASPARD, CASTAR BRETHELSON (1585-1629), Swed. physician; prof. of Med., Copenhagen; later prof. of Divinity; his descendants distinguished themselves in science.

BARTHOLOMÉ, PAUL ALBERT (1848-), Fr. sculptor and painter; among works is *Monument aux morts* in Père-Lachaise, Paris.

BARTHOLOMEW FAIR, fair held in Smithfield, London, on St. B.'s Day, from 1133 to 1855. It was a vast national market, opened by the Lord Mayor, and lasted for a fortnight.

BARTHOLOMEW, JOHN (1831-93), Scot. cartographer; b. Edinburgh; founded the Edinburgh Geographical Institute, an organisation of world-wide fame in cartographical work.

BARTHOLOMEW, ST., one of twelve Apostles; said to have been flayed alive, and then crucified head downwards; festival observed on Aug. 24.—*Massacre of St. B.* See FRANCE (p. 627 D).

BARTIZAN, a small, overhanging, battlemented turret, near a gateway, usually furnished with arrow-slits.

BARTLETT, JOHN (1820-1905), Amer. publisher and compiler; member of Boston bookselling and publishing firm; memorable as the compiler of *Familiar Quotations*, first pub. 1855; also pub. an exhaustive *Shakespeare Concordance* (1894).

BARTLETT, JOHN RUSSELL (1805-86), Amer. author and statesman; b. Providence, Rhode Is., became Sec. of State for Rhode Is.; edit. Records of the Colony (1636-1790); is chiefly remembered for his *Dictionary of Americanisms* (1848).

BARTLETT, PAUL WAYLAND (1865-), Amer. sculptor; b. New Haven (Conn.); has executed statues of Columbus and Michael Angelo for Washington, D.C., McJollan for Philadelphia, etc.

BARTOLI, DANIELO (1608-85), Ital. Jesuit; wrote history of Society of Jesus in 6 vols. (Rome, 1650-73).

BARTOLI, TADDEO DI (c. 1363-1422), Siennese painter; chief work: series of frescoes in chapel of municipality, Siena.

BARTOLINI, LORENZO (1777-1850), Ital. sculptor; produced, among other works, *Charity, Hercules and Lichas, Faith in God*, and bust of his patron Napoleon.

BARTOLOMMEI, MARQUIS FERDINANDO (1821-69), Ital. patriot; associate of Cavour and Mazzini; organised Tuscan contingent for war of Italy against Austria, and secured expulsion of Grand Duke from Florence.

BARTOLOMMEO DI PAGHOLA, FRA (1475-1517), Ital. artist; famous for his magnificent altarpieces; also for his friendship with Savonarola and Raphael.

BARTOLOZZI, FRANCESCO (1725-1815), Ital. engraver; b. Florence; studied at Rome and Venice; came to London (1764), where he spent a considerable portion of his life, but d. in Portugal. He contributed to *Boydell's Shakespeare Gallery*.

BARTON, ANDREW (d. 1511), Scot. merchant; regarded in England as bold pirate; slain by English in naval engagement; subject of ballad.

BARTON, BENJAMIN SMITH (1766-1815), Amer. naturalist; prof. at Philadelphia; pres. of Amer. Philosophical Soc.

BARTON, BERNARD (1784-1849), Eng. Quaker poet; b. Carlisle; bank-clerk at Woodbridge, Suffolk (1809); pub. *Metrical Effusions* (1812) and *Household Verses* (1845); was friend of Lamb, Southey, and Hogg, and was the father-in-law of Edward Fitzgerald.

BARTON, CLARA (1830-1912), Amer. philanthropist; app. head of hospital department in Amer. army, 1864; aided Red Cross Society in Franco-German war, and has since done much personal field work; became pres. of newly established Amer. Red Cross Society, 1881.

BARTON, SIR EDMUND (1849-1912), Australian

statesman; promoter of Australian Commonwealth and its first Prime Minister (1901-3).

BARTON, ELIZABETH (c. 1506-34), the 'Nun' or 'Maid' of Kent; forbade divorce of Henry VIII., prophesying his dethronement; executed at Tyburn.

BARTON BEDS, Upper Eocene grey and brown fossiliferous clays, with sandy layers; sands used in glass-making.

BARTON-UPON-HUMBER (53° 41' N., 0° 27' W.), town, Lincolnshire, England; tanning; pottery. Pop. (1911) 6876.

BARTON-UPON-IRWELL (53° 28' N., 2° 22' W.), town, Lancashire, England. Pop. (1911) 9270.

BARU, fibrous material obtained from leaves of *E. Indian sago-palm* and used in place of wool for cushions, etc.

BARUCH, THE APOCALYPSE OF, consists of a VI.-cent. Syriac MS. discovered by Ceriani in the Milan library in 1866, of which he produced a Latin trans. B. is said to have been companion and sec. of Jeremiah, and his work includes the prayer of the captives in Babylon, a dissertation on wisdom, and songs celebrating the return from captivity; see Charles, *Apocalypse of B.* (1896).

BARUGO (11° 15' N., 124° 50' E.), coast town, island Leyte, Philippine Islands; hemp. Pop. 12,000.

BARYATINSKY, ALEXANDER IVANOVITCH, PRINCE (1814-79), Russ. general and gov. and conqueror of the Caucasus.

BARYE, ANTOINE LOUIS (1796-1875), Fr. sculptor; in reproductions of animal life was the greatest modern Fr. master; exhibited *Theseus and the Minotaur* (1847), *Lapitha and the Centaur* (1848), besides executing many figures for the Tuileries, gardens, and public buildings.

BARYTES, HEAVY SPAR (BaSO_4), orthorhombic mineral occurring in metalliferous veins; known as *cawk* in Derbyshire lead-mines; sp. gr. 4.5; used as 'permanent white' pigment.

BARYTOCALCITE, BaCaCO_3 , monoclinic white transparent crystals, found only at Alston Moor, Cumberland, England.

BASALT, igneous (volcanic) rocks with dark cleavage surfaces, weathering to turbid shades; composition varied, chiefly felspars, olivine, augite, black hornblende, biotite, and nepheline, together with grains of magnetite; many are characterised by columnar picturesque conformations, of which Staffa and Giant's Causeway are well-known examples.

BASCINET, BASINET, BASNET, light peaked helmet, worn with or without a movable front, in common use during reigns of Edward I., II., III., and Richard II.

BASE (Chemistry), a compound which will unite with acids to form salts. All metallic oxides are b's, and are hence called **Basic Oxides** to distinguish them from non-metallic oxides, which, being acid-forming oxides, are called **Acid Oxides**.

BASE-BALL, national game of U.S.A., played with bat and ball upon a diamond-shaped mowed pitch, the points of the figure being named home-base, and 1st, 2nd, and 3rd bases. It is played by two sides of nine players each; if score is not equal nine innings completes a game, an innings being ended when three batsmen are out on each side.

Murnane, *How to Play Base-Ball* (New York).

BASEDOW, JOHANN BERNHARD (1723-90), Ger. educationist, disciple of Rousseau; wrote books embodying Rousseau's theory of education, and established institute at Dessau.

BASEL, BILE.—(1) (47° 23' N., 7° 35' E.) town, Switzerland; founded in Rom. times; includes Great and Little B., separated by Rhine; has XIV.-cent. cathedral, XV.-cent. univ., XVI.-cent. town hall. Pop. (1910) 131,914. (2) (47° 25' N., 7° 45' E.) canton, Switzerland; area, 177 sq. miles; comprises the half-cantons, B.-Stadt, B.-Land. Pop. (1910) 211,987.

Basel, Confession of, statement of faith, pro-

mulgated by Oswald Myconius, of Basel (1534); read in churches of that town annually on Wednesday in Passion Week up to 1820; later annulled.

Basel, Council of, summoned by Martin V. in 1424 at Pavia and in 1431 at Basel. Eugenius IV., succeeding in the latter year, found the council sitting with the aim of reforming the Church and putting down the Hussites. Eugenius, wishing to effect a union with the Gk. Church, dissolved the council in 1437, and convoked a council at Ferrara in 1438, where, the next year, a temporary union was effected. Meanwhile, the council of B., though deserted by most of its members, maintained its sittings, pronounced the deposition of Eugenius in 1439, and elected Felix V. Eugenius died in 1447, the anti-Pope abdicated in 1449, and Nicholas V., the successor of Eugenius, was acknowledged. The struggle between council and Pope at B. had ended in favour of the latter.

BASHAHR, see **RUSSAHR**.

BASHAN (32° 45' N., 36° 15' E.), extensive district, Palestine, E. of Upper Jordan; inhabited by Amorites; their king, Og, was conquered by Israelites; territory allotted to half-tribe of Manasseh; volcanic in origin; proverbially fertile; men, also cattle, remarkable for large stature.

BASHI-BAZOUK.—(1) Turk. cavalry force consisting of irregulars. (2) Turk. mounted police.

BASHEKALA (38° 12' N., 44° 21' E.), town, vilayet, Van, Asiatic Turkey.

BASHKIRS, Башкиры, people of Urals, Russia, of Tartar speech, Muhammadan religion.

BASHKIRTSEFF, MARIE (1800-84), Russ. author and artist of precocious talents; spoke four languages, read Gk. and Lat. authors in original, skilled musician, and achieved considerable eminence as a painter in Paris; chiefly remembered by remarkable *Journal* (begun in childhood and continued throughout her life), pub. 1887 (Eng. trans., 1890).

BASIL I. (d. 886), Byzantine emperor, called 'the Macedonian,' from birthplace; became sole emperor, 867; revived Byzantine power; extended his territory and codified the laws.

BASIL II. (c. 958-1025), Byzantine emperor, called 'Slayer of the Bulgarians'; great-great-grandson of Basil I. He and his bro. Constantine succ. their f., 963, as joint-emperors; B. made himself real master of army, and annexed Armenia and Bulgaria.

BASIL THE GREAT, ST. BASIL (329-79), bp. of Caesarea, in Cappadocia, one of most eminent Gk. Fathers; involved in most of religious controversies of time, and resolute opponent of Arianism. B. founded a monastic order, since known as *Basilian Monks*, which brought about a great change in the ideal of the religious life. He was dissatisfied with the eremitical life, and so established the cenobitical, believing that work and usefulness could be carried on in conjunction with saintliness and austerity. Consequently the *Rules of St. Basil* provided for common daily prayers, common meals, and hard field-work, while the austerities of this life were scarcely less than those practised by the Eremites. The Rules of St. Basil have been the inspiration of monasticism in the Gk. Church, and there can be no doubt that St. Benedict's Rule owes much to them.

BASILICA.—(1) Gk. digest, in 60 books, of Justinian's laws of the Byzantine empire, pub. in the early part of X. cent. (2) Roman building in which public meetings and legal tribunals were held. It consisted usually of an oblong nave, with side aisles, divided by colonnades, latter supporting a gallery. At one end of the building was a semicircular apse, with a dais, or raised seats, for the judges, or for other persons officiating in the business of the meeting. The first such built was the B. Porcia, erected at Rome, 184 B.C., by Cato 'the Censor.' B's continued to be built, in Rome and other Ital. towns, down to the end of the III. cent. A.D. The name was afterwards given to buildings built upon a similar plan for Christian worship, which were known as 'basilican churches.' See **ARCHITECTURE**.

BASILICATA (40° 25' N., 16° 10' E.), division of S. Italy, forming province Potenza.

BASILIDES (fl. 117 A.D.), Gnostic philosopher who lived at Alexandria during the rule of the Emperors Trajan and Hadrian.

BASILISK, imaginary malignant monster of the ancients (*cockatrice*); genus of lizards.

BASIM (20° 5' N., 77° 5' E.), town, Akola district, Berar, India. Pop. 12,500.

BASIN, BASON, a bowl; land drained by river and tributaries; rock beds with a centro-clinal dip depressions, often occupied by lakes, created glacially by solution of underlying strata, or by movements of the earth's crust.

BASIN, THOMAS (1412-91), Fr. bp. and his torian; app. bp. of Lisieux, 1447, which position he later renounced; cr. abp. of Caesarea by Sixtus IV. conspicuous public figure during troubled period wrote valuable history of Charles VII. and Louis XI.

BASINGSTOKE (51° 16' N., 1° 5' W.), town, Hampshire, England; connected with river Wey by canal; has Roman remains and ruined castle. Pop. (1911) 11,540.

BASKERVILLE, JOHN (1706-75), Eng. printer greatly developed art of typography; became printer to Cambridge Univ. (1758), and was noted for his editions of the Bible, Prayer Book, and Latin classics.

BASKET, plaited receptacle for carrying small articles; also protection for hand when fighting or fencing. B. work was primitive art; material—willow-wands, reeds, bamboo, Span. cane, split wood. These are soaked for some time, dried out of doors, used whole or split with a special b.-maker's instrument ('the splitter'). In plaiting, the bottom is first woven, and into it the sharpened ends of other pieces are plaited and turned up at the edges to form the sides; into these upright pieces are woven horizontal pieces over which they are at last turned down. Sharpened stakes, pushed down centres of the sides and fastened there, are woven together to form handle.

Plaited cane is largely used for common chairs, and was formerly much employed for sofas. B. work is to be seen in Chippendale furniture. Bamboo furniture was introduced into West from India and Japan, where it is an important manufacture.

BASKET-BALL, an Amer. game invented by James Naismith, in 1891. It is played by two sides of five players each, with an inflated leather-covered ball of about 10 in. diameter. The object is to throw the ball into the 'basket' (a net suspended 10 ft. above the ground), which the opposing team endeavour to prevent, as in football.

Hepbron, *How to Play Basket-Ball*.

BASKET-FISH, many-armed starfish, found off Amer. coast.

BASNAGE, JACQUES (1653-1725), Fr. Huguenot divine and theological writer.

BASOCHE, association of clerks of Paris, in existence XIV. cent. till Revolution; elected a king, etc.; among privileges was that of producing morality plays, *satires*, etc.; scurrilous *satires* (satirical farces) led to loss of their theatre, 1582.

BASQUES, a race of people inhabiting region at W. end of Pyrenees, including part of department of Basses-Pyrénées in France, and provinces of Biscaya, Guipuzcoa, and Alava, and part of Navarre in Spain. They retained practical independence in Spain until 1876, in France until time of Revolution. They are of good height and excellent physique, fair-skinned, and dark- or fair-haired; are brave, intelligent, hard-working, extremely religious, and characterised by great pride of birth; have long been famous as seamen and whalers. Many ethnologists hold they are descended from Iberians, the earliest-known inhabitants of the peninsula; while their language, *Euscara* or *Euscara*, is polysynthetic and is related to no other tongue known to philologists, whose researches have so far yielded no definite results. Grammars have been compiled by Van Eys, Prince Lucien Bonaparte,

and others, and the language is said to have eight dialects. Lit. is modern and comparatively unimportant, consisting chiefly of historical and religious plays, proverbs, and songs.

Basque Provinces (43° N., 2° 30' W.), district, N.E. Spain, on Bay of Biscay, comprising three provinces, Vizcaya, Guipuzcoa, Alava; traversed by Pyrenees; fertile soil; iron-mining centre; area, 2730 sq. miles. Pop. (1910) 671,488.

BAS-RELIEF, Basso-Relievo, term used in sculpture for designs in low relief.

BASS, male voice of lowest register; low-pitched musical instruments; low notes in harmony; kind of bag made of plaited straw or fibre.

BASS CLARINET, larger musical instrument than ordinary clarinet, and an octave lower in pitch; invented by Grenser, a Dresden maker, in 1793.

BASS ROCK, THE (56° 4' N., 2° 38' W.), islet, entrance of Firth of Forth, Scotland; 350 ft. high; circumference, one mile; served as prison for Covenanters; held by Jacobites against William III., 1691-94; frequented by solan geese; lighthouse.

BASS STRAIT (39° 20' S., 148° E.), channel between Australia and Tasmania, 80 to 150 miles wide.

BASS TUBA, see SAXHORN.

BASS, WILLIAM (b. 1720), Eng. brewer; founder of Messrs. Bass, Ratcliff, & Gt. Gt. Rd. Ld., a Burton-on-Trent firm of world-wide reputation.

BASSA (7° 40' N., 7° 30' E.), province, Brit. Protectorate, Northern Nigeria, W. Africa, bordering Benue river on N., Niger on W.; fertile, extensive forests. Pop. c. 500,000.

BASSANO (45° 46' N., 11° 43' E.), cathedral city, Vicenza, Italy; majolica. Pop. 6500.

BASSANO, JACOPO DA PONTE (1510-92), Ital. artist; his altarpiece of *The Nativity* at Bassano, his birthplace, was highly praised by Lanzi.

BASSARAB, BASSARABA, name of Rumanian dynasty ruling over Wallachia till 1658; XVI. and XVII.-cent. princes famous as builders and scholars.

BASSARIDE, species of carnivores whose dentition generally resembles canine; raccoon-like in appearance.

BASSE TERRE (16° 3' N., 61° 42' W.), town, Guadeloupe, W. Indies. Pop. 8656.

BASSEIN (16° 46' N., 94° 48' E.).—(1) mountainous district, Lower Burma; fertile; important centre of rice trade; area, 4127 sq. miles. Pop. 391,427. (2) town, in B. district. Pop. 31,400.

BASSELIN, OLIVIER (1400-50), Fr. poet; fuller by trade; b. Val-de-Vire, Normandy; famous for drinking-songs, called *Vaux-de-Vire*. He forms subject of poem by Longfellow.

BASSES, SEA-PERCHES (*Serranidae*), perch-like fish, marine, and found in all seas, although a few ascend rivers. The commonest Brit. form is the Basse (*Morone labrax*), which may weigh 20 lb., but he related Jew Fishes of tropical seas may be 6 ft. or more in height, weighing almost 600 lb. The Murray Cod (*Oligorus macquariensis*) is the most important cod-fish in the rivers of S.E. Australia.

BASSES-ALPES (44° 10' N., 6° E.), department, S.E. France; very mountainous; wool; area, 2698 sq. miles. Pop. (1911) 107,231.

BASSES-PYRÉNÉES (43° 15' N., 1° W.), department, S.W. France, consisting of former province of Bearn and part of Basque region; Pyrenees occupy northern portion, elevation increasing W. to E.; extensive forests covering slopes furnish most valuable product; N. and E. territory consists of pastures and fertile valleys; mineral springs; sheep, cattle; area, 3977 sq. miles. Pop. (1911) 433,318.

BASSET, Venetian card game, introduced into France during the latter part of the XVII. cent., where it became very popular. It was played by five persons with a full pack of cards.

BASSET, see DOG.

BASSET HORN, single-reed tenor clarinet; much

favoured in compositions of Mozart, Beethoven, and Mendelssohn; invented by a maker named Horn, about 1770.

BASSETERRE (17° 20' N., 62° 44' W.), town, St. Kitts, W. Indies. Pop. 9962.

BASSI, UGO (1800-49), Ital. revolutionist; became monk; joined national forces, 1848, as chaplain, in which capacity he played important part in Garibaldi movement.

BASSIGNY, district of ancient France, divided (1790) into departments of Meuse, Aube, and Upper Marne.

BASSOMPIERRE, FRANÇOIS DE (1679-1646), Fr. soldier and diplomatist; put down Huguenot rising of 1621-22, and became Maréchal de France. His *Mémoires* are important as a hist. source.

BASSOON, large dual-tubed wind instrument, of double-reed kind, serving as bass to oboe and clarinet; evolved from earlier and clumsier instrument, called 'bass-pommer,' which dates back to the XV. cent.; much favoured by Bach, Beethoven, Weber, Mozart, and other masters.

BASSORA, BASRA, BUSRA (32° N., 47° 34' E.), vilayet, Asiatic Turkey; capital and river port, BASRA, on Shat-el-Arab, near Persian Gulf; marshy, unhealthy; famous date groves; silk, cotton; area, 53,680 sq. miles. Pop. c. 600,000.

BASSUS, AUFIDIUS, Rom. historian and orator under Augustus and Tiberius.

BASSVILLE, NICOLAS JEAN HUGON DE (d. 1793), Fr. Revolutionary journalist and diplomatist; murdered in Rome by populace.

BASTAR (19° N., 81° 30' E.), native state, Brit. India; high flat plateau; some mountains; dense forests; jungles inhabited by aboriginal tribe; chief town, Jagdalpur; unhealthy; rice, oil-seeds; area, 13,002 sq. miles. Pop. (1911) 433,310.

BASTARD (O. Fr.), meaning 'pack-saddle child,' a child born out of wedlock. Such children are not legally entitled to bear the name of either parent, they cannot inherit real property, and, as they are in nearly every legal aspect *filius nullius* ('nobody's child'), the parents can have no control over their marriage. In Eng. law an Act of Parliament is required to legitimise such a child; in Scots law the subsequent marriage of the parents confers this privilege.

BASTI (26° 45' N., 82° 45' E.), town in district of B., United Provinces, India. Pop. 14,761.

BASTIA (42° 40' N., 9° 27' E.), seaport town, N.E. Corsica; former capital; oil. Pop. 23,659.

BASTIAN, ADOLF (1820-1905), distinguished Ger. ethnologist and traveller.

BASTIAN, HENRY CHARLTON (b. 1837), Eng. physician, author of important treatises on nerves and on the origin of life.

BASTIAT, FRÉDÉRIC (1801-50), Fr. political economist; started Fr. agitation against Protection (1844); organised Free Trade Association (1846); wrote against Socialism, setting forth virtues of competition (1848-50).

BASTIDE (O. Fr.), name of towns built XII.-XIV. cent's in southern France to guard surrounding regions.

BASTIDE, JULES (1800-79), Fr. soldier, editor, and (1848) Minister of Foreign Affairs.

BASTIEN-LEPAGE, JULES (1848-84), Fr. artist; painted portraits, landscapes, and hist. pictures: *Sarah Bernhardt*, *Joan of Arc listening to the Voices*, *Gambetta on his Death-bed*, *The Thames at London*.

BASTILLE (O. Fr. *bastir*, to build), name of Fr. castle; especially given to towers guarding city gates of Paris, and now only applied to that of St. Antoine, which in XVII. and XVIII. cent's was used to detain political prisoners. Associated with despotism, it was stormed by the populace, July 14, 1789, and destroyed with every accompaniment of violence and bloodshed; date since observed as *Fête Nationale*; its deep underground dungeons have given rise to many stories of wretched captivity.

BASTINADO (Span. *baston*, a stick), European

name for an Eastern form of punishment, consisting of light blows with a stick on the soles of the feet, or other parts of person; if long continued may cause death.

BASTION (Fr.), projection from fortification (*q.v.*).

BASTWICK, JOHN (1593-1654), Eng. Puritan; polemical writer.

BASUTOLAND (29° S., 28° E.), Brit. crown colony, S. Africa; area, 10,293 sq. miles; bounded by Orange Free State on N. and W., Cape Province on S., Griqualand and Natal on E. and N.E.; surface is part of great plateau, c. 5000 ft. above sea-level, and has mountains crossing it, including Maluti ranges and Drakenberg; principal rivers, Tugela, Caledon; capital, Maseru. Administration is carried out by resident commissioner, subject to authority of High Commissioner for S. Africa. Capital is Maseru. B. was annexed by Britain, 1868; became part of Cape Colony, 1871; war which occurred, 1890-81, in consequence of attempt to disarm natives, resulted in establishment of autonomy; again taken directly under authority of Imperial Government, 1884, since when trade and agriculture have greatly developed; took no part in Boer War, or native risings of 1906. Inhabitants are of negroid stock, majority Basutos proper, with admixture of other tribes. B. is a native reserve. Productions include great quantities of cereals; cattle, ponies, and sheep raised for export; coal is found. Pop. (1911) 405,600 (including 1400 whites).

Lagden, *The Basutos* (1909).

BAT, flying, insectivorous animal. See *CHIROPTERA*.

BATAC (16° 55' N., 120° 23' E.), town, Luzon, Philippine Islands; sugar. Pop. 23,500.

BATALA (31° 49' N., 75° 14' E.), town, Punjab, India; cotton, silk. Pop. 27,400.

BATALHA (39° 40' N., 8° 50' W.), town, district Leiria, Portugal; Dominican monastery, commemorates victory of King John I. of Portugal over king of Castile, 1385. Pop. 3900.

BATANGAS (13° 32' N., 121° 12' E.), seaport, Luzon, Philippine Islands; coffee. Pop. (1910) 33,100.

BATARNAY, IMBERT DE (1488-1523), Fr. soldier, statesman, and courtier.

BATAVIA, see *NETHERLANDS*.

BATAVIA.—(1) residency, Java; includes some adjacent islands; area, 24 sq. miles. Pop. 1,500,000. (2) (6° 15' S., 106° 50' E.) seaport, N. coast, Java; capital and chief commercial city, Dutch East Indies; bay, shallow towards coast, served as port before Tanjong Priok harbour, 6 miles N.E., was made; mixed population; unhealthy climate; founded beginning of XVII. cent.; held by British, 1811-14; coffee, rice, sugar, and other products. Pop. c. 138,551.

BATES, HARRY (1850-99), Eng. sculptor; Rodin; executed many busts and statues on subjects; A.R.A. (1892); some of his works, purchased by the Chantrey Trustees, are now in the Tate Gallery.

BATES, HENRY WALTER (1825-92), Eng. naturalist; explored the Amazon with A. R. Wallace; author of *The Naturalist on the Amazon* (1863); assist. sec. of the Roy. Geog. Soc., and eminent entomologist.

BATES, WILLIAM (1825-99), Eng. Nonconformist preacher and author; chaplain to Charles II.; pub. *The Existence of God and the Immortality of the Soul* (1870), *Spiritual Perfection* (1809), etc.

BATH.—(1) (51° 23' N., 2° 22' W.) watering-place and largest town, Somerset, England; on Avon; the Roman *Aqua Solis*; its hot saline and chalybeate springs were known to Romans from I. cent.; contains Rom. baths and other antiquities; Abbey Church, begun in Henry VII.'s reign, completed 1609; Bath and Wells have formed one bishopric since 1135; very fashionable in XVIII. cent. Pop. (1911) 50,726. (2) (43° 55' N., 69° 52' W.) city, county seat of Sagadahoc County, Maine, U.S.A.; shipbuilding. Pop. (1910) 9396.

BATH, ORDER OF THE, order of chivalry of

U.K., founded 1399, refounded 1725 and 1815, and frequently extended since; originally a purely military order, it received in 1815 a civil element; the civil and military badges, which are slightly different alike bear motto, *Tria juncta in uno*, about rose, shamrock, and thistle.

BATH, THOMAS THYNNE, 1ST MARQUESS OF (1734-96), Eng. politician; e. s. of Viscount Weymouth; libelled by Wilkes, who was therefore expelled from Parliament.

BATH, WILLIAM PULTENEY, 1ST EARL OF (1684-1764), Brit. statesman; took prominent part against Dr. Sacheverell; led opposition to Walpole, and on his fall, 1741, became Prime Minister; lost influence on accepting peerage (1742); gift of attack, but not administration; good scholar and orator.

BATHBRICK, piece of Bathstone (q.v.) made into bricks for domestic purposes at Bridgewater.

BATHGATE (55° 53' N., 3° 40' W.), town, Linlithgowshire, Scotland; minerals, paraffin. Pop. 8226.

BATHILDA, ST. (d. 880), Eng. princess; m. Clovis II. of France; regent during minority of Clothar III., Childeric II., and Thierry III.

BATHOLITE, igneous (granitic) rock intruded in stratified rocks, and forming bosses.

BATHONIAN SERIES, oolitic limestone strata, first studied near Bath; corresponds to Upper Dogger (Middle Jurassic) of Germany.

BATHORI, ELIZABETH (d. 1614), Polish princess, said to have been a werewolf; imprisoned 1610 on charge of numberless horrible murders.

BATHORY, SIGISMUND (1572-1613), Prince of Transylvania; disastrous anti-Turkish policy.

BATHOS, a descent from the elevated to the ridiculous (or commonplace); cf. **ANTICLIMAX**.

BATHS.—The habit of bathing, both for cleanliness and for pleasure, has been practised by almost every people from the earliest times. Before the inception of public and private b's it was customary to bathe in running water of rivers, but hot b's were employed by the early Egyptians, Greeks, and Persians, and are referred to in Homer as restorative after violent exertions. The buildings themselves must in primitive times have had considerable pretensions to luxury, for the b. of the Persian king, Darius, excited wonder and admiration of Alexander the Great. It was, however, under Rom. Empire that public b's reached most advanced stage of luxury. The earliest Roman b's were called *psiscinae*, and were cold swimming-baths, but later developed into vast establishments called *thermae*, which included cold swimming-b's for both sexes, hot b's, vapour b's, dressing-rooms, a gymnasium, and sometimes also a library and theatre. Such *thermae* were erected by the Emperors Agrippa, Nero, Titus, Domitian, and several later rulers. The b's appear to have reached their highest state of luxury under Diocletian. Marble seats were provided for thousands of bathers; water flowed from mouths of silver lions into basins of the same precious metal, and while young men played at ball in the spacious gymnasium, philosophers and elder folk discussed the news of the day in the marble galleries adorned with mosaics and enriched with sculptures. Soap being then unknown, the Romans had their bodies anointed by the b. attendants with oils and pomades, after which the skin was scraped with a curved metal instrument, called the *strigillus*; usual bathing hour was before dinner, but it was not uncommon to take several b's during course of day. In addition to hot-water and hot-air b's, sun b's were commonly indulged in by the Greeks and Romans, and the habit of burying the body in sand dates back to even earlier times. There are various modern specialised forms of bathing—Turkish, Russian, electric, mineral, etc.

Cold bathing in England has been commonly practised from the beginning of the XVIII. cent., and the value of *sea-bathing* was recognised somewhat later. Smollett, in *Humphry Clinker*, describes Scarborough bathing-machines as a novelty. The excessive use

of hot b's has an enervating effect; the cold bath, while undoubtedly beneficial to those of robust constitution, is often harmful to more delicate individuals.

The treatment of disease by baths is called **BALNEO-THERAPEUTICS**, but the term is generally now re-

mineral waters, mud baths, and other treatments in vogue at spas. The waters employed have usually the salts of sodium, calcium, magnesium, lithium, or iron, or sometimes other minerals dissolved in them; but the benefit is as much due to the change of air and scene, the regular bathing, dieting, and drinking of prescribed quantities of water, and the regular exercise, as to any therapeutic qualities of the waters themselves. Harrogate, Aix, Carlsbad, Marienbad, Homburg, Naubheim, Kissingen, Baden-Baden, etc., are all spas of repute for different diseases. See **HYDROPATHY**.

BATHSEBA, **BATHSHEBA**.—(1) Bible character; wife of Uriah the Hittite, slain for her sake by David, who then took her to wife. (2) Duchess of Portsmouth in Dryden's *Absalom and Achitophel*.

BATHSTONE, mixed limestone and sandstone (Lower Oolite stratum) obtained from neighbourhood of Bath; used for scouring and for covering hearths, etc.

BATHURST.—(1) (33° 27' S., 149° 35' E.) town, New South Wales. Pop. (1910) 10,000. (2) (43° 19' S., 146° E.) town, Tasmania. (3) (13° 24' N., 16° 36' W.) town, Gambia, W. Africa. Pop. 6000 to 8000.

BATHURST, EARLDOM OF (1772 onwards).—**ALLEN BATHURST** (1684-1775), 1st earl, belonged to old Sussex family and distinguished himself as Tory politician; cr. Baron B., 1712; earl, 1772; 2nd earl was Lord Chancellor, and was cr. Baron Apsley, 1771; 3rd earl became Secretary for War and Colonies, 1812; and Pres. of the Council, 1828-30.

BATHYBIUS, slimy precipitate of gypsum by alcohol in sea-water, at one time supposed to be a simple organism living in the deep sea.

BATISTE, fine, closely woven linen, said to be named from inventor, Baptiste of Cambrai, XIII. cent.

BATLEY (53° 43' N., 1° 38' W.), town, Yorkshire, England. Pop. (1911) 36,395.

BATNA (35° 33' N., 6° 8' E.), town, Algeria. Pop. 6914.

BATOIDEA, see **RAYS**.

BATON (Fr. *bâton*), staff carried by a field-marshal; a policeman's truncheon; light stick used by orchestra conductor; sign of illegitimacy in heraldry ('baton sinister'), often erroneously called 'the bar sinister.'

BATON ROUGE (30° 30' N., 91° 15' W.), city, Louisiana, U.S.A., on Mississippi; state capital, 1849-62, and again, 1880; captured from British by Spaniards, 1779; taken by Federalists, May 1862; held against attack by Confederates, Aug 1862; sugar and cotton plantations; state univ. Pop. (1910) 14,897.

BATRACHIA, class of vertebrates of interest as illustrating the transition from aquatic to terrestrial life; frequently considered conterminous with **AMPHIBIA**, or as a sub-class of the latter. Through the *Dipnoi* they are to a certain extent linked with fishes,



NEWT.



CAECILIAN (ICHTHYOPHIS) COILED ROUND ITS EGGS.

and through *Microsauria* (*Stegocephalia*) with reptiles. The main anatomical differences separating *Batrachians* from reptiles, although no satisfactory line of demarcation can be drawn, are the skull bones. Excepting a few viviparous forms, they mostly undergo a gill-breathing stage in their metamorphosis. The follow-

ing classification is convenient: (1) *Stegocephalia*, extinct lizard- or serpent-like b.: Upper Devonian to Triassic. (2) *Apoda*, limbless, worm-like, tropical b. belonging to 33 species; no fossil forms known. (3) *Caudata*, tailed b.; about 150 species; few fossil; salamanders well-known representatives. Three blind species inhabit N. Amer. and Europ. caves. A number of skin-breathing forms, without gills or lungs, have been discovered. (4) *Ecaudata*, containing about 1300 (including about 40 fossil) species of frogs and toads. See METAMORPHOSIS.

 FROG.

Cambridge Natural History, viii. (1901).

BATRACHOMYOMACHIA (Gk. 'battle of the frogs and mice'), mock-epic, in hexameter verse, of unknown authorship, sometimes ascribed to Homer.

BATTA, Anglo-Indian designation of rations served to soldiery in war.

BATTAGLIA (45° 15' N., 11° 50' E.), town, Venetia, Italy; warm saline springs.

BATTALION, military division consisting of four or more companies. The full war strength of an infantry b. in Brit. army consists of about 1000 men and staff.

BATTAMBANG (13° 6' N., 103° 6' E.), town, Cambodia, Siam; ceded to French, 1907.

BATTAS, cannibal race living in the hills of Sumatra. They read and write, and have a curious religion and lit., latter committed to bamboo staves.

BATTEN, joiner's name for a fir-board used in strengthening wooden framework; also marine term for strip of wood used aboard ship to prevent seawater entering the hatchways.

BATTEN, SIR WILLIAM (d. 1667), Eng. naval commander; surveyor to the navy, and Vice-Admiral; frequently mentioned by Pepys.

BATTENBERG, revived Ger. title conferred upon Countess von Hauke, morganatic wife of Prince Alexander of Hesse; made Countess of B. (1851), raised to rank of Princess, 1858; e. s., Louis, became admiral in Eng. navy; 3rd s., Henry Maurice, m. Princess Beatrice, Queen Victoria's dau. (1885), and d. 1896; the dau. of the latter, Victoria Eugénie, m. (1906) Alphonso XIII. of Spain. B. lies in Hesse-Nassau, Prussia.

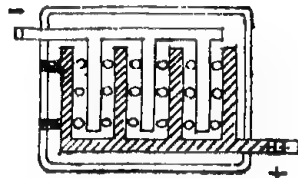
BATTERING-RAM, primitive military weapon, dating back to times of Josephus, or earlier, used for beating down the walls of a fortress; it was a heavy beam, about 120 ft. long, shod at the fore end with a piece of metal, shaped like a ram's head, and generally slung in a wooden protected framework.

BATTERSEA, metropolitan borough, S.W. London; Surrey side, Thames, opposite Chelsea, and communicating by bridges; fine park; factories and foundries.

BATTERY, a number of ordnance with their equipment; the men and horses attending a battery; battlemented platform upon which guns are mounted; in law, assault by beating.

Primary Electric B., VOLTAIC, GALVANIC, CHEMICAL B., an arrangement of cells, elements, or couples which produces a current by chemical action. The original VOLTAIC cell was a zinc and a copper plate resting in a weak acid solution and joined by a wire. The hydrogen liberated made a coating on the copper (or negative) plate, stimulated a reverse action, and weakened the current (*polarisation*). This was obviated in the DANIEL cell by placing the copper in a solution of copper sulphate in a porous pot, the hydrogen then replacing the copper which was deposited on the copper plate. In the LECLANCHÉ cell the zinc rests in sal-ammoniac solution, and a plate of carbon (replacing copper) is placed in a porous pot packed with manganese dioxide and bits of carbon. This is the cell generally used for electric batteries. It has an electromotive force of nearly $1\frac{1}{2}$ volt.

Secondary B., ACCUMULATOR or REVERSIBLE B., contrivance for the storage of electrical energy; an electric battery which can be charged by a current passing in the reverse direction of the current of discharge. The most effective accumulator is the lead-peroxide-sulphuric-acid cell, which essentially consists of plates or grids of lead coated with lead peroxide (PbO_2) connected with the positive, alternating with plates of pure lead connected with the negative electrode. They are immersed in sulphuric acid (H_2SO_4) and held apart by strips of glass or ebonite. In discharging the cell, hydrogen is conveyed to the positive plates and reduces the lead peroxide, the resulting lower oxide combining with the sulphuric acid to form lead sulphate. The lead of the negative plates becomes oxidised and also covered by a layer of the sulphate, the progress of the discharge being indicated by the weakening of the acid and decreased voltage. When the current is reversed by connecting the cell or battery with a dynamo, hydrogen is carried to the negative plates, reducing the lead sulphate to lead, and the oxygen converting the sulphate on the positive



PLAN OF ACCUMULATOR.

plates into peroxide of lead, and the sulphuric acid being formed in the process. It becomes apparent that the term *storage battery*, frequently used for accumulators, does not exactly mean a storage of electricity, but of the electro-chemical transformation products, the cell being reformed by charging after having been altered by the discharge. Many types of a. have been invented, the Planté, Faure, and Tudor cells being the best-known types. They are not only used for supplying motive power and light for vehicles and boats, and for experimental purposes, etc., but are indispensable in an electric-power station, where they serve to balance the ratio between demand and supply of electricity. A nickel-peroxide-iron-caustic-potash accumulator has been designed by Edison, but it can hardly be said that it has left the experimental stage.

F. Dolezalok, *The Theory of the Lead Accumulator* (1906); Sir D. Salomons, *Management of Accumulators* (1906).

BATTEUX, CHARLES (1713-80), Fr. philosopher; pub. *La Morale d'Épicure tirée de ses propres écrits* (1758), *Histoire des causes premières* (1769), *Cours de belles-lettres, Principes de la littérature*, etc.

BATTEYANI, family of Hungarian nobles who claim descent from Őrs, companion of Arpad; chief members, **Prince Karl Joseph** (1697-1772), Austrian field-marshal, distinguished in War of Austrian Succession; **Count Casimir** (1807-54), follower of Kossuth and Hungarian foreign minister; **Count Louis** (1806-49), premier of first responsible ministry, 1848, but resigned; executed by order of court-martial.

BATTLE (50° 55' N., 0° 30' E.), town, Sussex, England; received its present name (in place of *Senlac*) from the battle in which William I. defeated Harold, 1066. The conqueror founded there a Benedictine abbey in which was deposited **Battle Abbey Roll**, supposed list of barons who fought with William; authenticity of the copies is disputed.

Duchess of Cleveland, *Battle Abbey Roll*, 3 vols. (1889).

BATTLE CREEK (42° 20' N., 85° 10' W.), city, Michigan, U.S.A.; factories. Pop. (1910) 25,267.

BATTLEDORE (derivation unknown).—(1) Playing like small tennis-racket used in game of b. and shuttlecock; (2) (Obs.) hornbook; (3) implement used to beat clothes in washing; (4) applied to certain tools, etc.

BATTLEFORD (52° 40' N., 108° 20' W.), town, Saskatchewan, Canada.

BATTLEMENT, parapet surmounting walls of a fortified building, consisting of solid blocks of masonry

alternating with open spaces for the discharge of missiles, the solid parts being designated *merlons* and the apertures *crenels*. At first designed purely for defensive purposes, b's have, in modern times, come to be used merely for decorative effect.

BATTLESHIP, see NAVY, SHIPS.

BATTUE, the system of killing game by means of beating the bushes and driving the quarry towards a given point where the guns wait.

BATU, ROCK ISLANDS (0° 10' S., 98° E.), group of small islands, Dutch East Indies; cocoanuts.

BATUM, BATOUM (41° 38' N., 41° 40' E.), fortified seaport, Russ. Transcaucasia; exports oil. Pop. 30,008.

BATWA, nomad tribe of African pygmies, discovered in 1880 by Pogge and Wissmann, near Wissmann Falls (Bel. Congo); 4 ft. high; lightish skins; hunt game with bows and poisoned arrows.

BATYPHONE, musical instrument of the clarinet type, invented 1839; proved ineffective, and gave place to the bass tuba.

BAUAN (13° 50' N., 121° E.), town, Luzon, Philippine Islands; palm-fibre goods. Pop. 39,094.

BAUCHI (10° N., 9° 30' E.), province, Brit. Protectorate, N. Nigeria; larger portion, N.W. to S.E., occupied by belt of highlands; plateaus forming S.W. of province fertile and grow grain, cotton, indigo; inhabitants mainly pagan tribes; in consequence of persistent slave-raiding by Fula, a Brit. expedition was sent out, 1902; emir overthrown and country brought under Brit. rule. Pop. c. 40,000.

BAUCIS, wife, according to Ovid, *Metamorphoses*, of Philemon; the couple extended hospitality to Zeus in Phrygia, and in reward their house was changed into a temple while others were destroyed by floods; changed into trees in answer to their request that they might not be separated; types of conjugal constancy.

BAUDELAIRE, CHARLES PIERRE (1821-67), Fr. poet; after taking degree, 1839, led life of extravagant debauchery; acquired habits of opium and hashish; paralysis was followed by miserable death; first important literary work, translation of tales of horror of Edgar Allan Poe, in whom B. found kindred spirit, though his own poems far surpass those of Poe in depth and technique; bond between the two was their love of thrills and their morbidity; B. analyses himself in *Lunatiques*, an essay on those who are under influence of the moon and 'love all that it loves.' First collection of poems appeared 1857 as *Fleurs du mal*, some of which were excised by censors after prosecution of author; further translations from Poe and much critical work followed.

BAUDIER, MICHEL (1589-1645), Fr. historian; historiographer to Louis XIII.

BAUDRILLART, HENRI JOSEPH LÉON (1821-92), Fr. economist; author of *Jean Bodin et son temps* (1863), *Manuel d'économie politique* (1857), *Des rapports de la morale et de l'économie politique* (1860).

BAUDRY OF BOURGUEIL (d. 1130), Fr. poet and historian; became abbot of Bourgueil abbey (1079); abp. of Dol (1107); most important work, history of first crusade (1095-99) entitled *Historia Hierosolymitana*.

BAUDRY, PAUL JACQUES AIMÉ (1828-86), Fr. artist; excelled in portraits and classical subjects, and became famous for his mural decorations in foyer of Paris opera-house, and other public buildings.

BAUER, BRUNO (1809-82), Ger. theologian; free-lance Biblical critic of sceptical character; wrote numerous hist. treatises on the Gospels, Epistles, etc.

BAUER, CAROLINE (1807-78), Ger. actress of much celebrity; left memoirs, *Aus meinem Bühnenleben*, etc.

BAUHIN, GASPARD (1560-1624), anatomist and botanist; b. Switzerland, of Fr. descent.

BAUMBACH, RUDOLF (1840-1905), Ger. poet; b. Thuringia; made considerable reputation as writer of narrative and legendary verse and vagabond lyrics; pub. *Zlatorog* (1877), *Lieder eines fahrenden Gesellen*

(1878), *Frau Holde* (1881), *Von der Landstrasse* (1882), etc.

BAUME, ANTOINE (1728-1804), Fr. chemist; inventor of an hydrometer.

BAUME-LES-DAMES (47° 22' N., 6° 21' E.), town, Doubs, France; ancient abbey.

BAUMGARTEN, ALEXANDER GOTTLIEB (1714-62), Ger. philosopher; inventor of word *aesthetics*; pub. *Disputationes de nonnullis ad poema pertinentibus* (1735), *Aesthetica* (1739), *Ethica sophica* (1751), etc.

BAUMGARTEN, MICHAEL (1812-89), Ger. Prot. theologian; one of the founders of the Ger. Prot. League; writings include, *A Prophet-Voice from the Present*, *The Authentic Sayings of Christ*, *History of Jesus*, etc.

BAUMGARTEN-CRUSIUS, LUDWIG FRIEDRICH OTTO (1788-1842), Ger. Prot. preacher and author; from 1812, prof. of Theol. at Jena; pub. *Text-Book of Church Morals* (1826), *Sources of Bible Theology* (1828), *Compendium of Dogma* (1840), etc.

BAUR, FERDINAND CHRISTIAN (1792-1860), Ger. theologian; prof. of Theol. at Tübingen; wrote numerous works on Church history, Biblical criticism, and the philosophy of religion.

BAUTAIN, LOUIS EUGÈNE MARIE (1796-1867), Fr. philosopher; pub. *Philosophie du Christianisme* (1835), *Psychologie Expérimentale* (1839), *Philosophie morale* (1840), and other works of a like character.

BAUTZEN (51° 12' N., 8° 25' E.), capital of district of same name, Saxony; surrounded by old walls with towers; possesses Castle of Ortenburg and Early Gothic *Domkirche*; many industries; textile, machinery, ironworks, etc.; besieged by Hussites, 1431; captured by Saxons, 1620; Wallenstein, 1633; Saxons again, 1634; Napoleon defeated Russians here with great slaughter, 1813. Pop. (1910) 32,754.

BAUXITE, $Al_2O_3(OH)_3$, clay-like aluminium ore, similar to laterite, used in S. France and elsewhere for manufacture of aluminium. See ALUMINIUM.

BAVARIA, BAYERN (49° N., 12° E.), kingdom, E. side of S. Germany; area, 29,282 sq. miles. B. has detached portion called Palatinate or Rhenish B., W. of Rhine, N. of Alsace. Surface along boundaries is generally hilly; chief ranges, those of Alps in S. (highest peak, Zugspitze, 9700 ft.), Frankenwald, Fichtelgebirge and Rhongebirge in N.; Böhmerwald in N.E.; Haardt mountains in Palatinate; Palatinate is drained by Rhine and tributaries, S. of B. proper Danube with tributaries Isar and Inn, N. by Main. Danube and Main connected by Ludwig's Canal; principal lakes, Ammer See, Starnberger See, Walchen See. Climate various; lower parts have mean temperature of 50° Fahr., higher, 39°; rainfall is from 40 to 50 in.

History.—B. was apparently inhabited from about 600 B.C. by Celtic people, who were conquered by Rome late in I. cent. B.C. After fall of Western Empire country was occupied by tribes called Boiarii, who ultimately became tributary to Franks; ruled for over two cent's by dukes; formed part of Charlemagne's dominions, and after his death was governed first by margraves and after 920 by dukes; duchy held by Guelph family, 1070-1137; granted by emperor to Otto, Count of Wittelsbach, 1180, ancestor of present dynasty. During several cent's various partitions of duchy occurred, but in 1506 country was united under Albert the Wise, who established system of primogeniture; on extinction of younger or Bavarian line of Wittelsbach family with death of Maximilian Joseph in 1777, succession passed to representative of older branch, Charles Theodore, Elector Palatine, whose family had held Palatinate since 1329, when it was separated from B. proper. B. was after this involved in wars, first against Austria and afterwards against France, to whom she lost Palatinate in 1801. She then formed alliance with France, by whose aid she became a kingdom in 1805; subsequently joined alliance against Napoleon, 1813; regained Palatinate W. of

Rhine, 1814-15; new constitution granted by Maximilian, 1818; became integral part of Ger. Empire, 1871. Last king, Ludwig II. (q.v.), committed suicide in 1886; succ. by bro., Otto I., on account of whose insanity country is governed by regent.

Over half area is cultivated; chief wealth, produce of fertile soil; plains N. of Munich called 'granary of Germany'; chief crops are rye, oats, barley, wheat; hops, tobacco, vines grown in Franconia, flax in Upper B. and Swabia, vines in Palatinate; one-sixth of surface under grass, cattle and sheep largely raised, dairy-farming carried on; one-third of area under timber—oak, beech, pine; chief forest districts are along Alps, in S., in Franconia and Palatinate. Chief minerals are salt, coal, lignite, iron, graphite, lithographic stone; mineral springs abound. Most important manufacture is beer; other industries are penicill-making, Christmas card producing, distilling, manufacture of linens, woollens, glass, porcelain, sugar, toys, chemicals, jewellery, mathematical instruments. Capital is Munich. Pop. (1910) 6,887,291.

Buchner, *Geschichte von Baiern* (1853); Reizler, *Geschichte Bayerns* (1898); Baedeker, *Southern Germany* (1904).

BAVAY (50° 14' N., 3° 55' E.), town, Nord, France; marble quarries.

BAVENO (45° 55' N., 8° 15' E.), town, on Lake Maggiore, Italy; summer resort; granite quarries; cotton.

BAX, ERNEST BELFORT (1854—), Eng. Socialist and author; assisted Morris in founding Socialist League, 1885; writings chiefly on historical aspects of Socialism.

BAXTER, ANDREW (1686-1750), Scot. metaphysician; principal work, *Inquiry into the Nature of the Human Soul* (1733), an examination of the properties of matter.

BAXTER, RICHARD (1615-91), Eng. Puritan preacher; b. Rowton, Salop. During the Civil War he acted as chaplain in the Parliamentary army; strongly opposed to execution of Charles I., and was influential in bringing about the Restoration; became Charles II.'s chaplain. B. subsequently underwent much persecution at the hands of Judge Jeffreys, being imprisoned for eighteen months. He was noted for the saintliness of his private life, and, though he suffered continually from ill-health, his industry was remarkable. He is credited with the authorship of nearly 170 works, of which the best known is his *Saints' Everlasting Rest* (1690), others being *Call to the Unconverted* (1657), *The Life of Faith* (1670), and *Christian Directory* (1675); see *Life*, by Davies (1887).

BAY, indentation in a coast-line; chestnut colour (see **BAYARD**); peculiar bark of a dog (hence Scott's 'deep-mouthed bloodhound's heavy bay'); the laurel tree (hence to be 'crowned with bays' is to be crowned with laurel leaves); bay-window, window in bay (division of room architecturally severed from rest).

BAY CITY (43° 38' N., 83° 14' W.), city, Michigan, U.S.A.; seat, Bay County; fish, salt. Pop. 45,160.

BAY ISLANDS (16° 30' N., 86° 30' W.), group in Caribbean Sea, N. of Honduras, to which they belong; fruit, Pop. 6020.

BAY RUM, rum distilled with bayberry leaves; used extensively by hairdressers.

BAYADERES, dancing women of India of the two ranks—*devadasi*, who perform religious dances in services of the *devas*, and *nautchis*, wonderfully trained secular dancers.

BAYAMO (20° 27' N., 76° 57' W.), town, on river B., E. Cuba; sugar-cane. Pop. 4100.

BAYARD (O. Fr. 'bay'), orig. bay horse; especially applied to celebrated bay steed of Rinaldo (q.v.).

BAYARD, PIERRE TERRAIL, CHEVALIER DE (1473-1524), Fr. military commander; b. Dauphiné; perfect example of chivalrous knight of mediæval type; was renowned for looks, bravery, kindness, piety, and military genius—the *Ochevalier sans Peur et sans Reproche*. After serving as page to the Duke of

Saxony, he entered the service of Charles VIII. of France, whom he accompanied into Italy; distinguished himself at battle of Fornova (1495), when he was knighted; held the bridge of the Garigliano single-handed against 200 Spaniards; took part in the sieges of Genoa, Padua, and Brescia; displayed remarkable bravery at the battle of Ravenna (1512); fell a prisoner to Henry VIII. at the *Battle of Spurs* (1513), but was immediately set at liberty; conferred knighthood on Francis I., at latter's request, after the victory of *Marignano*; killed in defending passage of the Sesia against the Milanese.

BAYARD, THOMAS FRANCIS (1828-98), Amer. democratic statesman and diplomatist; ambassador to Great Britain in Bering Sea controversy.

BAYASID, BAJAZET (39° 27' N., 44° 9' E.), fortified town, Armenia, Asiatic Turkey; military station.

BAYBAY (10° 42' N., 124° 55' E.), town, W. coast of Loyte, Philippine Islands; hemp, rice. Pop. 17,000.

BAYBERRY (*Pimenta acris*), tropical Amer. plant of myrtle order; leaves used for bay rum.

BAYEUX (49° 13' N., 0° 43' W.), town, capital of Calvados, France; early Gothic cathedral; museum contains celebrated B. tapestry; lace. Pop. 7800.

—*Bayeux Tapestry*, represents 72 scenes in Conquest of England, 1066; agreed to be contemporary work; exhibited by B. municipality.

BAYLE, PIERRE (1647-1706), Fr. author and philosopher; pub. *Pensées diverses sur la Comète de 1680* (1682), *Dictionnaire historique et critique, Nouvelles de la République des Lettres*; for some years prof. of Philosophy and History at Rotterdam; attitude towards established beliefs and attempt to modernise knowledge anticipate work of *philosophes* and encyclopædists of succeeding cent., who drew much from him.

BAYLY, THOMAS HAYNES (1797-1839), Eng. dramatist and song-writer, e.g. *She wore a Wreath of Roses*; *I'd be a Butterfly*.

BAYNES, THOMAS SPENCER (1823-87), Eng. philosopher and man of letters; ed. Bath and Edinburgh Univ.; edited *Edinburgh Guardian* (1850-52); assistant-editor of *Daily News* (1858); prof. of Logic at St. Andrews (1864); app. editor of *Encyclopædia Britannica*, 9th edition (1873), with which he was associated until his death.

BAYONET, short sword fixed to muzzle of rifle; introduced into Fr. army by Louvois under Louis XIV.; takes name from Bayonne (q.v.).

BAYONNE.—(1) (43° 27' N., 1° 33' W.) fortified town, Basses-Pyrénées, France, on Adour; in possession of English, 1152-1451; XII.-cent. cathedral; gave name to *bayonet*; chocolate, leather; large trade. Pop. 27,000. (2) (40° 40' N., 74° 6' W.) city, Hudson County, New Jersey, U.S.A.; factories. Pop. 55,545.

BAYOU, American-French for lake formed at bend in river by flood joining the arms of the bend.

BAYREUTH, BAIREUTH (49° 55' N., 11° 32' E.), town, Upper Franconia, Bavaria; former residence of margraves; noted musical festivals; national theatre erected by Ludwig II. for performance of Wagner's operas; houses of Wagner and Richter; Liszt's burial-place; woollen, linen, and cotton goods. Pop. (1910) 34,547.

BAZA (37° 33' N., 2° 43' W.), ancient town, Granada, Spain.

BAZAAR, Persian word for market, a line of stalls or booths; in England it has been adopted as general name for sale-of-work for charitable or other purposes, and for retail establishments in which objects of varied character are sold at same price.

BAZAINE, FRANÇOIS ACHILLE (1811-88), Fr. soldier; rose from ranks; made general in Crimean War; commander of Legion of Honour (1855); marshal and senator of France (1864); chief commander in Franco-German War; charged with treason for Fr. defeat, and sentenced to 20 years' detention for capitulating at Metz before necessity demanded.

BAZALGETTE, SIR JOSEPH WILLIAM (1819-91), Eng. engineer; chief engineer, London Metro-

politan Board of Works; carried out sewage system, Thames Embankment, Putney and Battersea bridges.

BAZARD, AMAND (1791-1832), Fr. Socialist; wrote *Exposition de la doctrine de Saint-Simon* and founded the *Charbonnerie française*, branch of Carbonari (q.v.).

BAZAS (44° 27' N., 0° 12' W.), town, Gironde, S.W. France; tanneries. Pop. c. 5000.

BAZIGARS, nomadic people of India; Muhammadans.

BAZIN, FRANÇOIS (1816-78), Fr. musical composer; among his comic operas is *Le Maître Pathelin*.

BAZIN, RENÉ (1853-), Fr. novelist; member of the *Académie française*; pub. *Une Tache d'encre*, (1888), *Donatienne* (1903), *Le Blé qui lève* (1907), *Les Oberlé*, and numerous other novels and books of travel, many of which are trans. into English.

BDELLIUM, certain myrrh-like gum-resins.

BEACHES, RAISED, ancient sea margins presenting horizontal terraces at varying heights above present sea-level, caused by gradual elevation of land.

BEACHY HEAD (50° 44' N., 0° 15' E.), headland, S. coast of Sussex, England; perpendicular chalk cliff, projecting into Eng. Channel, 570 ft. high; French gained naval victory over combined Eng. and Dutch fleets, 1690; Belle lighthouse erected, 1831.

BEACONSFIELD.—(1) (51° 35' N., 0° 42' W.) market town and parish, Buckinghamshire, England; burial-place of Edmund Burke. (2) (28° 55' S., 24° 45' E.) town, adjoining Kimberley, S. Africa; diamonds. Pop. (1911) 14,295. (3) (41° 10' S., 146° 46' E.) town, Tasmania, centre of goldfields. Pop. c. 3000.

BEACONSFIELD, BENJAMIN DISRAELI, EARL OF (1804-81), Eng. statesman and novelist; b. London; s. of Isaac Disraeli (author of *Curiosities of Literature*, etc.). The f. with all his family abandoned Judaism, and Benjamin was baptized in the Eng. Church (1817). He received little schooling, but had the run of his f.'s extensive library; in solicitor's office, Old Jewry, 1821-23; entered at Lincoln's Inn (1824), but, having made acquaintance of John Murray, turned attention to literature; achieved considerable success with his novel *Vivian Grey* (1826); became society dandy; health breaking down, he travelled abroad for some years, reappearing as Radical candidate for High Wycombe (1832); attacked Liberals in *Letters of Runnymede* (1836); returned as Conservative member for Maidstone (1837); delivered maiden speech in House, a disastrous failure, but memorable for his prediction, 'The time will come when you will hear me'; at first a follower of Peel, but went over to the Protectionists; became Chancellor of the Exchequer under Lord Derby (1852), again (1858-59 and 1866); Prime Minister for a short time (1868), and again took office (1874-80). During this period were passed a *Factory Act*, *Artisans' Duellings Act*, and the *Agricultural Holdings Act*; or. Earl of Beaconsfield in 1876. D. was undoubtedly one of the greatest statesmen of modern times; a master of epigram and brilliant debater; his many novels remain as valuable pictures of the times in which he lived. The best of these are: *Lothair*, *Sybil*, *Coningsby*, *Tancred*, and *Henrietta Temple*, most of which were pub. during the earlier years of the writer's political career.

Authoritative Life, by Monypenny (2 vols., 1910, 1912). There are also *Memoirs* by J. A. Froude, T. E. Kebbel, Harold Gorst, and F. Hitchman.

BEADLE, parish officer, app. by the vestry, who received wages out of the church rate. Until the transference of poor-law business to the Guardians, in 1834, he was an officer of some importance. The word survives in the 'bedels' of Oxford and the 'Esquire-bedels' of Cambridge, who are honorary attendants upon the Vice-Chancellor.

BEADS, glass b's are made from rough glass tubing, which is cut into small sections and heated in moving drums with charcoal, etc. They have been used as ornaments from earliest times, specimens being found in Assyrian temples, on Egyptian mummies, and in the graves of Romans, Greeks, and Britons.

B's have also been used from very early times to count any given number of prayers, and they are so used by Buddhists and Muhammadans to-day. Sometimes the b's are berries, and a definite number is marked by metal discs or threads of silk. Their use has its origin in the systematisation of the instinct to repeat given petitions or praises, and in Christianity this has been found as in paganism. The early hermits used to count their petitions by numbers of stones, but the string of b's has resulted in the *Rosary* (q.v.), an obviously more convenient form.

BEAGLING, old Eng. sport. The beagle resembles a foxhound, but is much smaller (smallness being one of its points), with very short legs and not anything like the speed of the foxhound; the pack is therefore followed on foot, often with the addition of hunting poles for clearing obstacles, and used only for chasing hares and rabbits. Beagles have deep bell-like bay to which they probably owe their name, and are extremely intelligent and faithful; now to great extent superseded by harriers.

BEAK, bill of a bird or anything of similar shape, as jaws of Cuttlefish, avicularium of Polyzoa, umbo of Lamellibranch shells, snout of Weevils, and prow of a ship.

BEALE, DOROTHEA (1831-1906), Eng. educationist; b. London; ed. Queen's Coll.; principal of Cheltenham Ladies' College, 1858, till death; raised college to foremost rank and exercised a remarkable influence over her pupils.

BEAM, one of stout transverse timber props which support ship's deck; whence b. of ship means its breadth, and term 'b. ends' means turned on side.

BEAN, seed of certain leguminous plants, as *Vicia*, *Lotus*, *Phaseolus*, *Glycine*, universally cultivated for food; the broad b. (*Faba vulgaris*) was, with bacon, a favourite Roman dish.

BEAN-FEAST, colloquial term for any kind of 'social feast'; probably derived from the old custom of putting the Twelfth-Night cake, in which a bean was hidden, the receiver of which was declared the king.

BEAR (*Ursidae*), family of Arctoid carnivores; widely distributed except in Australia and Africa S. of Atlas Mts. Arrangement of teeth (molars) facilitates feeding on vegetable diet; plantigrade, entire sole of feet used for walking. Soles of polar bear are covered with hair to prevent slipping on ice. Chief varieties are: common brown b. (*Ursus arctos*), of Europe and Asia; polar b. (*Ursus maritimus*); grizzly b. (*Ursus horribilis*), and black b. (*Ursus americanus*), of N. America; spectacled b. (*Ursus ornatus*), of the Andes; sloth b. (*Ursus labiatus*), of S. Asia and Ceylon.

BEAR, term applied on Stock Exchange to (1) person who, having sold stock not yet in his possession, with idea of buying and delivering it when prices have gone down, seeks to lower prices; (2) stock so sold.

BEAR, GREAT AND LITTLE, see *URSA MAJOR* AND *MINOR*.

BEAR LAKE (45° 37' N., 67° 5' W.), lake, New Brunswick, Canada.

BEAR LAKE, GREAT (60° N., 120° W.), lake, N.W. Canada.

BEAR-BAITING and **BULL-BAITING**, brutal form of Eng. sport in vogue from the times of Henry II. until its prohibition in 1835; conducted in amphitheatres called 'bear-gardens', in which the bear was chained to a stake and worried by bull-dogs. The bull was also frequently tethered, and his nose well peppered to render him more ferocious. Queen Elizabeth used to witness these exhibitions, and the 'Paris arden' on the Bankside was a noted resort at that period. The sport dates back to the Romans, and was popular throughout Europe.

BEARD, see *HAIR*.

BEARD, WILLIAM HOLBROOK (1825-1900), Amer. artist; member of Nat. Academy of Design; noted for his humorous pictures of animals.

BEARDSLEY, AUBREY VINCENT (1872-98), Eng. black-and-white artist; b. Brighton; appeared first as an infant musical prodigy; from 1893 until his

death from consumption, ranked as the foremost artist in the decadent and grotesque of his day; work marked by extreme beauty of line; some of most distinctive work was done for the *Yellow Book* and the *Savoy* magazine, also for the *Morte d'Arthur* (Dent), Wilde's *Salome*, and *The Rape of the Lock*.

BEARDSTOWN (39° 57' N., 90° 11' W.), city, Illinois, U.S.A.; factories, fishing. Pop. (1910) 6107.

BEARER COMPANY, commissariat and ambulance department of brigade in Brit. army.

BEARING, direction of ship with respect to points of compass, or b. of any mark relative to fore-and-aft line of ship (naut.); part of building resting on support, as beam upon wall, or span between supports (arch.); support which permits moving part of machine to revolve or slide (mech.). The simplest b. consists of block and cap containing two semicylindrical 'brasses' between which the shaft journal rests, and lubrication contrivance to interpose film of oil between journal and brasses. In *thrust block* b., the journal is provided with collars fitting into circumferential grooves in the brasses, to prevent longitudinal shifting of shaft, e.g. of propeller shaft. *Footstep* or *pivot* b. supports the entire weight of vertical shaft and must, therefore, be provided with special lubricating apparatus. Friction is considerably reduced by fitting roller or ball b., which are extensively used in cycles and motor-cars.

BEARN (42° 30' N., 0° 10' W.), ancient province; S. France; united with France by Henry of Navarre; now forms part of department Basses-Pyrénées; capital, Pau.

BEAS, Bias (31° 56' N., 75° 45' E.), river, Punjab, India; rises in Kulu Mts.; joins Sutlej.

BEATIFICATION, in the R.C. Church an initial stage in the process of canonisation.

BEATON, DAVID (1494-1540), Scot. cardinal; s. of John B. of Balfour (Fife); ed. St. Andrews, Glasgow, and Paris; Abbot of Arbroath (1525); Lord Privy Seal (1528); or. Cardinal by Paul III. (1538); succ. his uncle, James B., as b.p. of St. Andrews (1539); became Chancellor of Scotland, and made himself hated by his persecutions of the Protestants; died at the hands of assassins in the castle of St. Andrews, May 29, 1546.

BEATRICE.—(1) Florentine lady (1266-90), wife of Simone de' Bardi; beloved by Dante, whose writings she inspired. (2) Principal character in Shakespeare's *Much Ado About Nothing*. (3) Princess B. (1857-), youngest dau. of Queen Victoria, wife of Prince Henry of Battenberg (d. 1896) and mother of Victoria Eugénie, who m. Alphonso XIII. of Spain (1906).

BEATRICE (40° 17' N., 96° 45' W.), city, Nebraska, U.S.A.; dairy products. Pop. (1910) 9356.

BEATTIE, JAMES (1735-1803), Scot. poet; ed. Marischal Coll., Aberdeen, where he afterwards held chair of Moral Philosophy; chiefly remembered as author of *The Minstrel* (1771-74), a long poem in the Spenserian stanza, and very popular in his day; lived on intimate terms with Dr. Johnson and other literary men of the period who highly valued his character.

BEAU, the leader of male fashion in the XVIII. and early XIX. cent's, the period of wig, patch, powder, enamelled snuff-box, satin knee-breeches, etc., which may be studied in Austin Dobson's *Ballad of B. Brocade*. Bath, Tunbridge Wells, Harrogate, Scarborough, and other resorts to which the rank and fashion flocked to take the waters, offered highly organised social enjoyments culminating in the Assembly and presided over by the b.; the b. owed his position largely to his wit, but chiefly to his elegance.

One of earliest was **Richard Nash** (fl. 1700), who held sway over Bath as master of the ceremonies, 1704-20; **George Bryan Brummell** (1778-1840), who was raised from lowly rank by the Prince of Wales and flourished until 1816, was accepted by royalties as their superior; the last of the b's was the Frenchman, **Alfred, Count d'Orsay** (1798-1852), who lived a good deal in England, where he initiated modern dress, and was

arbitrator elegantiarum in France under the Second Empire. See **COSTUME**.

BEAUCAIRE (43° 47' N., 4° 39' E.), town, on Rhône, France; formerly centre of trade; noted fair; stone quarries. Pop. 9160.

BEAUCE (48° 20' N., 1° 50' E.), district, Eure-et-Loir and Loir-et-Cher, France; wheat.

BEAUCHAMP, ALPHONSE DE (1767-1832), Fr. author and historian; useful writings on contemporary events.

BEAUCLERK (= good scholar), surname of Henry I. of England.

BEAUFORT, Eng. family prominent in XIV. and XV. cent's, descended from John of Gaunt, Duke of Lancaster, who named his four illegitimate children after his Norman castle of B. The B's were declared legitimate in 1397, but excluded from succession to throne, 1407. The male line became extinct in Wars of Roses.

BEAUFORT SCALE, numbers from 0 to 12 to indicate wind force from calm to hurricane, established by Admiral Beaufort, 1805.

BEAUFORT WEST (32° 17' S., 22° 20' E.), town and district, Cape Province, S. Africa; sheep-farming. Pop. of district c. 10,000, of town c. 3000.

BEAUFORT, FRANÇOIS DE VENDÔME, DUC DE (1616-69), Fr. soldier and courtier; popular nicknames, *roi des halles*.

BEAUFORT, HENRY (c. 1377-1447), bp. of Winchester and Cardinal, 2nd illegitimate s. of John of Gaunt, Duke of Lancaster; bp. of Lincoln, 1398, of Winchester, 1404; took part of Prince Henry against Henry IV. and was important statesman when former succ. to throne; assisted Pope's party at Council of Constance, 1417, and against Hussites, and was made Cardinal, 1429; retained position under Henry VI., whose misfortunes date from B.'s death.

BEAUFORT, LOUIS DE (d. 1796), Fr. historian; criticised traditions of early history of Rome.

BEAUGENCY (47° 46' N., 1° 40' E.), town, Loiret, France; captured by Joan of Arc from English, 1428. Pop. 3800.

BEAUHARNAIS, Fr. noble family, still represented. **Alexandre** (1760-94), Vicomte de B., m. Josephine (q.v.) Tascher de la Pagerie, afterwards first wife of Napoleon; elegant manners of old noblesse; served Revolution as general of army of Rhine, 1792, but executed; dau., **Hortense**, m. Louis Bonaparte, and was mother of Napoleon III.; son, **Eugène de B.** (1781-1824), Fr. soldier; stepson and favourite of Napoleon I.; served in Napoleon's wars, and became Prince of the Empire and Viceroy of Italy; brave and skilful general.

BEAUJEU (46° 10' N., 4° 30' E.), town, Rhône, France; capital of former province of Beaujolais; wine. Pop. 3400.

BEAUJOLAIS (46° 1' N., 4° 10' E.), district of France in north part of old province of Lyonnais. The fief came to the crown in XVI. cent., but was afterwards settled on Duke of Orleans; B. wines are famous.

BEAULIEU (43° 40' N., 7° 30' E.), village, Alpes-Maritimes, France; winter resort.

BEAULY (57° 29' N., 4° 27' W.), town, on river B., Inverness-shire, Scotland; ruined Priory.

BEAUMANOIR, Fr. lordship which gave name to family distinguished in history. Jean de B. was one of heroes of the *Combat des trente* (1351); his successor, Jean (1551-1614), was marshal of France.

BEAUMARCHAIS, PIERRE AUGUSTIN CARON DE (1732-99), Fr. dramatist; b. Paris; s. of a watchmaker named Caron, and apprenticed to the same trade. Possessed of handsome person and agreeable manners, he secured appointment at court, changed his name, and rose to be the soc. to the king. His first attempt at dramatic writing was drama *Eugénie* (1767), but it was the production of *Le Barbier de Séville* (1775) and *Le Mariage de Figaro* (1784) which established his fame as a comic dramatist. These plays, his best, show Moliéresque skilful construction, wit, and irony; still enjoyed in France, but

best known to foreigners through the operas of Mozart and Rossini respectively; inimitable *Mémoires*.

BEAUMARIS (53° 17' N., 4° 6' W.), town, Anglesea, Wales. Pop. (1911) 2233.

BEAUMONT (30° 7' N., 94° 5' W.), city, on Neches River, Texas, U.S.A.; lumber centre; oil-fields. Pop. (1910) 20,640.

BEAUMONT (Belmont, Bellemont), name of Eng. family, taken from Beaumont-le-Roger in Normandy; held lands in England, 1086; summoned to Parliament as barons by writ from 1309.

BEAUMONT, CHRISTOPHE DE (1703-81), abp. of Paris; noted for opposition to the Jansenists; pub. a formal condemnation of Rousseau's *Emile*, to which R. replied in his famous *Lettre à M. de Beaumont* (1762).

BEAUMONT, FRANCIS (1584-1616), and **FLETCHER, JOHN** (1579-1625), Eng. dramatists; described by Swinburne as 'the Dioscuri of Eng. poetry.' B. was the s. of Sir Francis B., Judge of the Common Pleas, and was b. at Grace Dieu, Leicestershire; ed. Broadgates Hall (now Pembroke Coll.), Oxford; left without taking a degree (1600), and entered the Inner Temple to read for the law. In London he made the acquaintance of Ben Jonson and other 'Mermaid' poets, wrote a translation of Ovid and some miscellaneous verses, and formed a friendship with F. The two poets lived together until B.'s marriage in 1613 with Ursula Isley, an heiress. B. was buried in Westminster Abbey. Fletcher was the s. of Richard F., afterwards bp. of London; b. Rye; ed. Bene't (now Corpus Christi) Coll., Cambridge; like many univ. men of the period in search of fortune, drifted into the service of the theatre. He died of the plague.

Of the fifty plays attributed to the two dramatists, *The Maid's Tragedy*, *Philaster*, *The Knight of the Burning Pestle*, and *The Faithful Shepherdess* (by F. alone) are considered the finest examples, and rank only below the masterpieces of Shakespeare. The general opinion seems to be that B. had the loftier genius, while F. had more constructive ability and excelled in wit and fancy. It is also known that the two were sometimes associated with other dramatists in the writing of plays—notably with Shakespeare, Massinger, Jonson, and Shirley. *The Two Noble Kinsmen*, sometimes attributed to Shakespeare, was largely the work of F.; while he was associated with Massinger in the authorship of part at least of Shakespeare's *Henry VIII.*

Selection of their best plays in the series of *Mermaid Dramatists*; vol. vi. of *Cambridge History of Eng. Lit.*

BEAUMONT, SIR JOHN (1583-1627), Eng. poet; elder bro. of Francis B., the dramatist; best known for his poem on *Dorset's Field*, pub. after his death (1629). He also wrote a long poem, *The Crown of Thorns*, which was greatly admired in MS. (lost).

BEAUNE (47° 1' N., 4° 51' E.), town, Côte d'Or, France; ancient ramparts; XV.-cent. hospital of St. Esprit; XIII.-cent. church; famous wines. Pop. c. 14,000.

BEAUREGARD, PIERRE GUSTAVE TOUTANT (1818-93), Amer. general in army of South, and military writer.

BEAUREPAIRE, NICOLAS JOSEPH (1740-92), Fr. commander who slew himself when Verdun was about to fall before Prussians.

BEAUSÉANT, device and standard of knights of Temple (q.v.).

BEAUSOBRE, ISAAC DE (1659-1738), Fr. Huguenot, scholar, and theologian; wrote valuable *Manichéisme*.

BEAUVAIS (49° 26' N., 2° 5' E.), town, capital of Oise, France; besieged by English, 1433; defended against Charles the Bold of Burgundy by female inhabitants under Jeanne Hachette, 1472; fine Gothic cathedral; Gobelin tapestry. Pop. c. 20,000.

BEAUVAU, Fr. noble family of Anjou; among prominent members was CHARLES JUSTE DE B. (1720-93), marshal of France.

BEAUVILLIER, name of Fr. noble family prominent XV. to XVIII. cent's.

BEAUVOIR, ROGER DE (1806-66), nom de plume of EUGÈNE AUGUSTE ROGER DE BULLY, Fr. novelist of independent means and extravagant habits, who amused himself by writing romantic novels, of which *L'École de Chumy ou le Sophisme* (1832) is considered a good example.

BEAUX, CECILIA (1863-), celebrated Amer. portrait-painter; amongst her sitters has been Mrs. Roosevelt.

BEAVER (*Castor fiber*), largest European aquatic rodent, closely related to Amer. b. (*C. canadensis*), valued for fur and as food. Fossil remains found in superficial deposits; *Trogotherium cuvieri* a giant Pleistocene genus. See RODENTIA.

BEAVER DAM (43° 28' N., 89° 57' W.), city, Wisconsin, U.S.A.; woollen and cotton goods. Pop. c. 6758.

BEAVER FALLS (40° 46' N., 80° 36' W.), borough, Pennsylvania; iron and steel industries. Pop. (1910) 12,191.

BEAWAR, BEAWE (26° 9' N., 74° 23' E.), town, Rajputana, India; cotton. Pop. 22,000.

BEBEL, FERDINAND AUGUST (1840-), Ger. Socialist, of school of Karl Marx; sat in Reichstag for over 30 years; now most important member of Social Democrat party.

BEC ABBEY, founded 1034 at Rouen, Normandy, by Benedictine monks; centre of civilisation; from it came Lanfranc and Anselm, abps of Canterbury.

BECCAFICO (fam. *Sylviidae*), small bird living on figs and grapes.

BECCAFUMI, DOMENICO DI PACE (1486-1551), Ital. artist; s. of a peasant; displayed remarkable talent for art from earliest years, and, having been well trained, executed great number of religious pictures for churches; famous for share in designing magnificent pavement in cathedral at Siena.

BECCARIA, CESARE DE (1738-94), Ital. philosopher who wrote on amendment of criminal law.

BECCLES (52° 37' N., 1° 34' E.), market town, Suffolk, England; printing works. Pop. (1911) 7100.

BÊCHE-DE-MER, TREPANO, see ECHINODERMATA.

BECHER, JOHANN JOACHIM (1635-82), Ger. chemist and physician; wrote on such varied subjects as metallurgy, physics, a universal language, and commerce. His ideas on combustion induced G. E. Stahl to formulate the Phlogiston Hypothesis. See STAHL.

BECHUANALAND (26° S., 23° E.), great district, Brit. S. Africa, between Zambesi and Orange Rivers, and between German S.W. Africa on W. and Transvaal on E. Southern part, as far N. as river Molopo, was incorporated with Cape Colony in 1895; rest of district, extending to Victoria Falls on Zambesi, is a protectorate. Surface is part of great central plateau, with elevation of 4000 to 5000 ft.; rainfall varies from 25 in. in E. to 10 in W. B. produces maize, millet; great herds of cattle. There seems to be plenty of underground water, and wells and irrigation might render soil very fertile. Gold occurs in places. Chief town is Mafeking; area of Cape part, 51,254 sq. miles. Pop. (1911) 99,538 (including 15,009 whites). Area of Protectorate, c. 270,000 sq. miles.

Administration of Protectorate is carried out by Resident Commissioner under direction of High Commissioner. Inhabitants belong to Bamaungato, Bangwaketsi, Bakwena, and other tribes, each of which is ruled by native chief, under supervision of Commissioner. Various missions have been established since beginning of XIX. cent., and David Livingstone lived for time at Kolobeng and carried on explorations. B. was included in Brit. sphere of influence, 1885. Pop. 125,350. See also SOUTH AFRICA.

BECK, CHRISTIAN DANIEL (1757-1832), Ger. scholar; prof. at Leipzig Univ.; edit. works of Euripides, Plato, Cicero, and many other classical authors.

BECK, JAKOB SIGISMUND (1761-1840), Ger. philosopher; follower of Kant.

BECKENHAM (51° 24' N., 0° 2' W.), town, Kent, England, 8 miles S.E. of London. Pop. (1911) 31,700. **BECKER, HEINRICH** (1770–1822), Ger. actor; for long the idol of the Weimar stage, and was held in great estimation by Goethe.

BECKER, KARL FERDINAND (1804–77), Ger. musical critic and collector; wrote several works on music.

BECKER, WILHELM ADOLF (1796–1846), Ger. classical scholar; b. Dresden; prof. of Archaeology at Leipzig, chiefly known for his *Gallus* (1838) and *Charicles* (1840), clever studies of daily lives of ancient Greeks and Romans.

BECKET, THOMAS (1118–70), abp. of Canterbury, and Chancellor under Henry II.; s. of a London portreeve; member of the household of Abp. Theobald, whom he accompanied to Rome (1143); was made Archbishop of Canterbury (1154); Chancellor of England (1155). He now became Henry's chief adviser, lived in great magnificence, and encouraged the king in all his warlike enterprises, himself taking a chief part in leading the Eng. army in France. In 1162, upon Theobald's death, Henry appointed him to the See of Canterbury, and from this time he gave himself thoroughly to ascetic practices, and became the Church's enthusiastic champion. Refusing his assent to the Constitutions of Clarendon, he was exiled, but returned in 1170. Some hasty words which Henry let fall were acted upon by certain of Becket's enemies, and the Abp. was murdered in his own cathedral. He was canonised (1172), and his shrine became a noted place of pilgrimage, as related in the *Canterbury Tales* of Chaucer.

Lives of Becket by Robertson (1859), Morris (1885), Hutton (1910).

BECKFORD, WILLIAM (1760–1844), Eng. author; s. of William B., who was twice Lord Mayor of London; inherited an income of £100,000 a year, most of which he squandered in extravagant building schemes; famous as the author of *Vathek* (1782), a mysterious Oriental romance, characteristic product of Romantic movement in England. B. was also noted for his eccentricities. He m. Lady Margaret Gordon, and one of his two dau's became Duchess of Hamilton.

BECKINGHAM, THOMAS (1390–1465), Eng. prelate and statesman; sec. to Henry VI.; was sent on an embassy to Calais, 1439, and wrote an account of it in Latin; on his return made Lord Privy Seal, and Bp. of Bath and Wells.

BECKMANN, JOHANN (1739–1811), Ger. scientific author; founder of the science of technology.

BEQUE, HENRY FRANÇOIS (1837–99), Fr. dramatist; produced *Michel Pauper* (1870), *Les Corbeaux* (1882), *La Parisienne* (1885), and other plays.

BEQUEREL, distinguished Fr. family. **ANTOINE CÉSAR B.** (1788–1878), prof. of Physics in Paris; Copley medal of Royal Society of London, 1837, for memoirs on electricity.—**ALEXANDRE EDMOND B.** (1820–91), s., authority on optics, inventor of phosphoroscope.—**ANTOINE HENRI B.** (1852–1908), s. of preceding; discovered radioactivity (q.v.); Nobel prize, 1903.

BED, article of furniture for sleeping upon. Ancient Egyptian beds were high, and were ascended by steps; early Gk. beds consisted of a wooden frame, with head-board, and across the frame bands of hide were stretched; at a later period the frames were richly inlaid, and the b. coverings were handsomely embroidered. In Europe the b. developed from the simple pallet to the hearse-like structure which is familiar to all visitors to show-places where royal beds are among the curiosities. These unhealthy erections, with little modification, lasted well on into the Victorian era, when they were replaced by metal frames. There is now a widespread tendency to revert to the use of wooden frames, of a plain and light character.

BED (*stratum*), deposit of sedimentary rocks in layers; thin layers are termed *laminae*.

BED OF JUSTICE (Fr. *lit de justice*), use of pre-

rogative of Fr. monarch to enforce, as supreme power in state, registration of his edicts by recalcitrant *parlements*; supposed to be named after cushioned throne on which king sat on those occasions.

BEDARIEUX (43° 37' N., 3° 12' E.), town, S. France; cloth-weaving, dyeing, tanning. Pop. 5800.

BED-BUG, see under **BUG**.

BEDCHAMBER, OFFICIALS OF THE, the chief is titular functionary, the *Groom of the Stole* in case of male ruler, *Mistress of the Robes* in case of female ruler; next in rank are *Lords or Ladies of the B.* (to king or queen regnant respectively), and beneath them grooms or b. women; lucrative and much-coveted posts. **THE B. QUESTION**, 1839, when the queen refused to allow Peel as prime minister to dispose of these posts, resulted in his refusing to form a Cabinet.

BEDDOES, THOMAS (1780–1808), Eng. physician and scientist; reader in chem. at Oxford (1788); forced to resign because of revolutionary sympathies (1792); established a 'Pneumatic Institution' at Clifton (1798) for treatment of disease by inhalation of different gases, Humphry Davy being the actual superintendent.

BEDDOES, THOMAS LOVELL (1803–49), Eng. dramatic poet; s. of Thomas B. (q.v.); nephew of Maria Edgeworth; ed. *Charterhouse* and *Pembroke Coll.*, Oxford; author of *The Improvisatore* (1820), *The Bride's Tragedy* (1822), and a posthumous play, the solemn and beautiful *Death's Jest-Book* (1850). His plays are inspired by the Elizabethans, and some of his lyrics, which are of considerable beauty, betray the influence of Shelley.

BEDA, BÆDA (672–735), Eng. historian; usually called 'the Venerable'; author of the *Ecclesiastical History of the English Nation*, written 731, in the preface to which he gives the history of his own life. In early youth he was placed under care of Benedict Biscop, Abbot of Wearmouth, later under that of Ceolfrith, Abbot of Jarrow, where he spent remainder of his life; there he was buried, but his bones were removed to Durham during the XI. cent. He has been called 'the father of Eng. history,' and was undoubtedly the most learned Englishman of his time and chief source of O.E. history. Amongst other works he wrote a *History of the Abbots*, and a scientific treatise, *De Natura Rerum*; see *Venerable Bede*, by Browne.

BEDA, CUTHBERT (1827–89), pseudonym of EDWARD BRADLEY, Eng. humorist; b. Kidderminster; ed. Durham and Oxford; took holy orders and held various livings; chiefly remembered for *Adventures of Mr. Verdant Green, an Oxford Freshman* (1853).

BEDEGUAR GALL, see **GALL-FINES**.

BEDELL, WILLIAM (1571–1642), Anglican Bp. of Kilmore and Ardagh; trans. *Book of Common Prayer* into Ital., and directed trans. of Bible into Erse.

BEDESMAN, a pensioner whose duty it was to pray for the souls of others. In Scotland the king's bedesmen, who wore blue gowns and metal badges, were permitted to beg throughout the kingdom. No bedesmen were app. after 1833.

BEDFORD.—(1) (52° 8' N., 0° 28' W.) county town, Bedfordshire; on Ouse; important for its educational institutions, which originated in the gift of Sir William Harpur, 1561; statue and relics of John Bunyan; agricultural implements, lace, straw-plaiting. Pop. (1911) 39,200. (2) (38° 53' N., 86° 32' W.) city, Indiana, U.S.A.; stone quarries. Pop. 8716. (3) (40° 2' N., 78° 28' W.) town, Pennsylvania, U.S.A., near B. Mineral Springs, a summer resort. Pop. 2235.

BEDFORD, EARLDOM AND DUKEDOM OF.—**JOHN PLANTAGENET**, Duke of B. (1389–1435), 3rd s. of Henry IV., was cr. Duke of B. by his bro., Henry V., in 1414. On Henry's death (1422) he became Regent of England, and continued Henry's work of conquest in France, forming an alliance with the Duke of Burgundy, whose sister he m. Stemming the tide of disasters which followed the siege of Orleans, he crowned Henry VI. king at Paris (1431), but the English con-

tinued to lose ground, and after an abortive attempt to arrange terms of peace, B. died at Rouen, without legitimate issue.—**GEORGE NAVILL** (1457-83), s. of Earl of Northumberland, was cr. Duke of B. (1470), but was degraded from the rank after his f.'s attainder and death.—**JAMES TUDOR** (1430-95), uncle of Henry VII., was cr. Duke of B. (1485), but d. without legitimate issue.—**JOHN RUSSELL**, Earl of B. (1486-1555), was a favourite of Henry VIII., acted as diplomatic envoy on the Continent, and held high offices of state under Henry VIII., Edward VI., and Mary.—**FRANCIS RUSSELL**, 2nd Earl of B. (1527-85), was a prominent statesman under Elizabeth. He was succeeded by his grandson **EDWARD** (1572-1627), who d. without issue.—**FRANCIS RUSSELL**, 4th Earl of B. (1593-1641), cousin of 3rd earl, was a leader of the Parliamentarians, dying in the middle of the struggle, and had a great part in the drainage of the Fens, called the *Bedford Level*.—His s. **WILLIAM** (1613-1700) fought latterly on the side of the king in the Civil War, and was cr. Duke of B. (1694). The title descended to his grandson **WRIOTHESLEY** (1680-1711), who was succ. by his son **WRIOTHESLEY** (1708-32), succ. by his bro. **JOHN RUSSELL** (1710-71), 4th Duke of B., a prominent politician, a Cabinet minister under Pelham, Bute, and Grenville, Viceroy of Ireland (1756-61), and holder of many other public offices.—**FRANCIS RUSSELL**, 5th Duke of B. (1765-1802), grandson of 4th duke, was a friend of George IV., a leading politician, and much interested in agriculture. His bro. **JOHN** (1766-1839) succ., and from him the title descended to his s. **FRANCIS** (1788-1861), and grandson **WILLIAM** (1809-72). The latter was succ. by his cousin **FRANCIS CHARLES HASTINGS** (1819-91), the title after his death going to the grandson of the 6th duke, both of whose sons, **GEORGE WILLIAM FRANCIS SACKVILLE RUSSELL** (1852-93), and **HERBRAND ARTHUR RUSSELL** (1858-), succ. in turn to the title, the latter being interested in natural history, and pres. of Zoological Society.

BEDFORDSHIRE (52° 4' N., 0° 24' W.), county, England, bordering on Huntingdon, Northampton, Buckingham, Hertford, Cambridge; about 36 miles long, 21 broad; area, c. 466 sq. miles; mainly consists of fertile clayey plain, undulating and well wooded, watered by Ouse and tributaries, and bounded on S. by Dunstable and Luton Downs, continuations of Chiltern Hills. County is partly devoted to sheep-grazing, partly to market-gardening, partly to corn-growing; manufactures: straw-plaiting, pillow-lace, rush-matting; produces phosphate of lime and fuller's earth; county town, Bedford (q.v.), parliamentary borough; ten market towns; Watling Street passes through county, and there are other traces of Roman occupation; many old churches, affording fine examples of Saxon, Norman, and later architecture. Pop. (1911) 197,660.

BEDIVERE, SIR, knight of Round Table; attended Arthur on his death-bed and threw Excalibur into the mere.

BEDLAM, generic name for lunatic asylums, derived from the name Bethlehem Hospital, Bishops' St., London, founded as a priory by Sheriff Simon Fitz Mary in 1247, and used as the first lunatic asylum in England about a hundred years later; it was transferred to Moorfields in 1675, and finally to St. George's Fields, Lambeth.

BEDLINGTON (55° 7' N., 1° 38' W.), town, on Blyth, Durham, England; coal, iron. Pop. (1911) 25,697.

BEDMAR, **ALFONSO DE LA CUEVA**, **MARQUIS DE** (1572-1655), bp. of Oviedo, cardinal and governor of Netherlands; his plot against Venice, 1618, subject of Otway's *Venice Preserved*.

BEDOUINS (Arab. 'people of the desert'), name given to Arab tribes who inhabit the desert; of noble, regular physique; wild and warlike, and of primitive hospitality.

BED-SORE, form of ulceration or gangrene caused,

in persons confined to bed, by prolonged pressure usually over a bony prominence, especially if the part be moist with perspiration, urine, or discharge from wound; interference with nerve supply of the skin and general debility predispose strongly to b.s. It can be prevented by regularly changing the position of the person, by cleanliness and keeping the skin on prominent parts dry, e.g. by sponging with water and then rubbing with methylated spirits, which is then allowed to dry on the skin, or dusting with boracic powder.

BEDWORTH (52° 29' N., 1° 29' W.), town, Warwickshire, England; coal, iron. Pop. 7200.

BEE (*Anthophila*), family of hymenopterous insects with feather-like hairs on head and body; mouth parts modified for sucking nectar from flowers; first legs possess mechanism for cleaning antennae, third legs broadened, and (in workers) modified for gathering pollen; like other Hymenoptera (q.v.) they undergo complete metamorphosis. From primitive 'solitary' species, of curious nesting habits, have evolved the social bees with two kinds of females, reproductive queens and, ordinarily, sterile workers, the Brit. hive bee (*Apis mellifica*), domesticated from ancient times, being the common and most highly specialised representative. The differentiation of labour in the wonderful organisation of the hive-bee society is less marked in the *humble-bees* (*Bombus*), where the queen in addition to her egg-laying functions also assists the workers.

The hive bee swarms in early summer. The workers, after a great commotion, having stuffed themselves with honey and loaded their legs with a resinous substance called *propolis*, fly with a fertilised queen to form a new colony. The workers settle on the proposed site, usually in a hive, and wait for a day till the temperature has risen sufficiently to enable them to exude small plates of wax from eight pockets on the lower side of abdomen. After the wax has been kneaded by the jaws of the workers it is fixed at the top of the hive, and the construction of the hexagonal cells proceeds till the comb is completed. Egg-laying now begins, most cells receiving fertilised (worker) eggs, others, built larger for the purpose, parthenogenetic (*drone*) eggs, the queen probably instinctively regulating fertilisation. While the eggs in the drone cells develop into *drones*, stingless males, whose sole function is that of sex, the fertilised eggs give rise to workers or queens according to the food given to the grubs. While the worker grubs are fed with pollen and honey, those destined by the community to develop into queens are in specially built cells, 'royal cradles,' fed with a more nutritious preparation called 'royal jelly.' Should there be no queen, a new one is developed by the workers by feeding a worker grub on 'royal jelly.' The entire development of a queen, from egg through grub-pupa stage to adult, requires 16 days, that of a worker 21 days, of a drone 24 days. The older workers gather the honey while the younger ones are engaged in various duties inside the hive, feeding the grubs, ventilating the hive, keeping it clean, repairing cells with *propolis*, fighting alien bees, and destroying the surplus drones, if the hive has a breeding queen. The virgin queen kills her rivals on returning to the hive after having engaged on her nuptial flight, fertilisation occurring in mid-air by the strongest and best-flying drone. If a new colony is to be founded, the nuptial flight takes place, and the first queen escapes with a band of workers. Honey is stored in large quantities for winter consumption.

Bee-Keeping.—Bees are most important domesticated animals, not only being providers of honey, but also indispensable for fertilising flowering plants which are themselves adapted to the insects in the same measure as the latter are modified for collecting nectar. From the earliest times, when a hollowed tree served as a hive, to the straw skep, and, finally, to the modern scientific bee farm (*apary*) of N. America, with its annual harvest of more than 100,000 lb. of honey, many improvements in bee-

keeping have led to the latter result. These improvements have been the wooden frame, the artificial comb foundation, and other appliances to direct and aid the bees in completing the comb, the centrifugal honey extractor, which enables the bee-keeper to use the same comb again, and, above all, a greater knowledge of the bees and their diseases. Many of these can be prevented, the most destructive being *foul brood*, *dysentery*, and *Isle of Wight disease*.

F. R. Cheshire, *Bees and Bee-Keeping* (London, 1885-88); **M. Maeterlinck**, *The Life of the Bee* (London, 1901); *The British Bee Journal*, weekly since 1873; *Bee-Keeper's Record*, monthly since 1882.

BEECH (*Fagus*), genus of trees of temperate regions, containing about 16 species, e.g. *F. sylvatica* (Europe), *F. americana* (Eastern N. America), *F. antarctica*, and the evergreen *F. betuloides* (Tierra del Fuego). The fruit (mast) is edible. Ancient Runic tablets were made of b.-wood slabs; the word has same root as Sanskrit *bokoz*, letter.

BEECHAM, THOMAS (1879-), Eng. musical composer and conductor.

BEECHER, CHARLES EMERSON (1856-1904), Amer. palaeontologist; authority on brachiopoda and crustacea.

BEECHER, LYMAN (1775-1863), Amer. preacher; sometime pres. of Lane Theological Seminary, Cincinnati; enjoyed great popularity as preacher; *Collected Works*, 3 vols. (1852), *Autobiography*, 2 vols. (1863-64). He was the f. of Henry Ward B., Mrs. H. B. Stowe, Edward B., Charles B., Thomas Kinnicutt B., Catherine Esther B., all of whom obtained considerable distinction either as writers or preachers. **Beecher, Henry Ward** (1813-87), as pastor of Plymouth Congregational Church, Brooklyn, N.Y., established a reputation as a preacher which made him famous throughout English-speaking world; pub. *Seven Lectures to Young Men* (1844), *Life Thoughts* (1858), *Life of Christ* (1871), and numerous other works. **Beecher Stowe**, Harriet Elizabeth (1811-96); m. Rev. Calvin Stowe, 1832; her *Uncle Tom's Cabin* pub. in *The National Era*, 1850; in book form, 1852) was read all over the world, and excited popular feeling against system of slave-owning.

BEECHY ISLAND (74° 40' N., 92° W.), island, Brit. N. America.

BEECHY LAKE (65° 33' N., 105° 50' W.), lake, Brit. N. America.

BEECHY, FREDERICK WILLIAM (1796-1856), Eng. explorer; after serving in navy and later in explorations under Franklin and Admiral Smyth, spent three years exploring under his own flag, and pub. (1831) *Voyage to the Pacific and Bering's Strait to Co-operate with the Polar Expeditions, 1825-28*; rear-admiral, 1854.

BEECHY, SIR WILLIAM (1753-1839), Eng. artist; portrait-painter to Queen Charlotte and other members of the royal family; A.R.A. (1793); R.A. and knighthood (1798).

BEECHING, HENRY CHARLES (1859-), Eng. clergyman and poet; Canon of Westminster (1902); Dean of Norwich (1911); has pub. *In a Garden and other Poems* (1895); *Seven Sermons to Schoolboys* (1894); has edit. *A Paradise of English Poetry* (1892), *Lyra Sacra* (1894), besides editions of Milton, Crashaw, Herrick, and Henry Vaughan.

BEECHWORTH (36° 22' S., 146° 41' E.), town, Victoria, Australia; gold-mining. Pop. 7400.

BEE-EATERS, small family of bright-coloured birds (*Meropidae*) which catch their insect food on the wing; they inhabit the Old World; *Merops apiaster* is a rare British visitor.

BEEF, old pl. **BEUFES**, flesh of ox, bull, or cow, and, formally, those animals themselves; joints out by Eng. butchers are sirloin, rump, aitchbone, buttock, mouse buttock, veiny parts, thick flank, thin flank, shin, fore ribs, middle ribs, chuck ribs, leg-of-mutton piece, brisket, clod, neck, chuck.

BEEF-EATER.—(1) Hypothetical original O.E

retainer. (2) Yeoman of the Guard, a body first formed by Henry VII.; Tudor costume still worn. (3) Warder of Tower.

BEEFSTEAK CLUB, otherwise 'The Sublime Society of Steaks,' founded by John Rich at Covent Garden Theatre, which, besides royalties, numbered amongst its members Hogarth, Garrick, and Wilkes. The club met later at the Bedford Coffee-House and the Lyceum Theatre.

BEELZEBUB, a name of uncertain derivation. In *2 Kings* 1 we find mention of Baal-zebub, the god of Ekron; while in *Mark* 3²²⁻²⁷ B. is identified with the devil, and of Christ it is said by the scribes, 'He hath Beelzebub, and by the prince of the devils casteth he out devils.' In Milton's *Paradise Lost* (Bk. ii.) B. ranks as second to Satan.

BEER, see **BREWING**.

BEER ACTS, see **LICENSING LAWS**.

BEER MONEY, payment made in Brit. army, 1800-78, to non-commissioned officers and privates in lieu of allowance of ale.

BEERBOHM, MAX (1872-), Eng. paradoxical and impressionist writer, and caricaturist of such fame that misrepresentation by his pen is stamp of celebrity.

BEERSHEBA (31° 17' N., 34° 54' E.), most southerly village in Canaan; mentioned in Old Testament from times of Abraham; 'from Dan even unto B.' meant the whole of Palestine; site marked by ruins and two circular wells.

BEESLY, EDWARD SPENCER (1831-), Eng. historian and positivist; sometime editor of the *Positivist Review*.

BEESTINGS, milk taken from cow after calving; much richer than ordinary milk.

BEEZWAX, secretion of worker bees when forming honeycomb, of which it composes cells.

BEET (*Beta vulgaris*), edible biennial, forming succulent tap-root first season, flowering stem following year; numerous varieties, e.g. field b., garden b., mangold-wurzel. From certain varieties sugar is obtained. See **SUGAR**.

BEETHOVEN, LUDWIG VAN (1770-1827), Ger. composer; b. Bonn; s. of a tenor singer at the Elector of Cologne's court, a man of violent temper and drunken habits, with the natural result that the family suffered dire poverty during Ludwig's early years. The f., discerning the precocity of his s., was eager to turn his musical gifts to profit at the earliest possible date, and commenced the child's training at the age of five. By the time he was nine, however, the elder B. could teach him no more, and he passed successively into the hands of another singer, Pfeiffer, Ries, Van den Eden (the court organist), and his successor, Neefe. As early as 1781 B. had acted as deputy to the latter; in 1783 he was made cymbalist at the Bonn theatre, and, in the following year, was given a court appointment under Neefe. In 1787 he visited Vienna, where he played before Mozart, and received a few lessons from him. But the illness of his mother, to whom he was greatly attached, and her subsequent death put an end to these advantageous studies, and he returned to his work at Bonn and the charge of his f.'s household, of which he was the chief support. In his native town he had won the friendship of Count Waldstein, through whose instrumentality the Elector was induced to send B. again to Vienna (1792), where he quickly made a reputation for himself by his playing and extemporisation.

Vienna was destined to be his home for the remainder of his life, and immediately after settling there he placed himself under the tuition of Haydn. B., however, did not get on comfortably with his tutor, and was dissatisfied with his progress. He therefore took lessons from Schenk, and studied counterpoint later with Albrechtsberger, and the violin with Schuppanzigh. It was in Vienna, consequently, that all his chief works were composed, and in this great musical centre he formed many lasting friendships. Yet there was much in B. that was calculated to destroy friendly relations, for, though a man of the

most generous and noble character, he frequently treated his best and most intimate friends with inconsiderate rudeness and in civility. Perhaps some portion of this defect of character may have resulted from the deafness with which he had been afflicted since before he was thirty years of age, and which increased to such an extent that, from 1822 until his death, he could only be communicated with in writing. Yet it may be mentioned incidentally that some of his greatest compositions belong to this period.

To B.'s first period belong: first two symphonies, first 10 sonatas (including *Pathétique*, 1799, and *Moonlight*), string trios, first 6 string quartets, *Mount of Olives* (oratorio), and most of the sets of variations for piano-forte. Second period includes most of his greatest works, e.g. *Kreutzer Sonata* (violin and piano), 1803; 3rd (*Eroica*) Symphony, 1804; *Fidelio* (Opera), 1805, *Appassionata Sonata*, 4th Symphony, and 32 Variations in C minor for Piano-forte, 1806; C minor (5th), and *Pastoral* (6th) Symphony, 1807; and G minor Piano-forte Concerto, 1807; Violin Concerto and *Lebewohl Sonata*, 1809; music to *Egmont* and trio in B \flat , 1810; Symphonies 7 and 8, 1812. To the last period belong 9th (*Choral*) Symphony (1823 onwards); last 4 piano-forte sonatas, last 4 string quartets, *Missa Solemnis*, 2 overtures, and other minor works. The greatest musical composer of all time, B.'s earlier works were akin to Mozart and Haydn; his later works marked entirely new departures, characterised by amazing individuality of style and classical beauty and perfection of form.

Corder, *Beethoven* (1912); Grove, *Beethoven and his Nine Symphonies* (1896); Thayer, *Life of Beethoven*; Diehl, *Life* (1908).

BEETLE, coleopterous insect. Black b's are cockroaches (q.v.), not true b's. See **COLEOPTERA**.

BEETS, NICOLAAS (1814-1903), Dutch writer and divine who has won distinction for stories and criticism.

BEFANA (Ital.), fairy benefactor who on Twelfth Night (Epiphany) attends to the wants of children. It used to be customary to parade her effigy in the streets on eve of Epiphany.

BEGAS, KARL (1794-1854), Ger. artist; painted Biblical and hist. pictures, and portraits of public men; was court painter to the king of Prussia.

BEGAS, REINHOLD (1831-), Ger. sculptor; s. of Karl B.; has executed statues of Schiller, von Humboldt, and Bismarck, for Berlin; the sarcophagi of the Emp. Frederick III. and the Empress Frederick; and the national monument to the Emp. William at Berlin.

BEGG, JAMES (1808-83), Scot. Presbyterian divine; led secession, 1843, and rigorously maintained independence of Free Church.

BEGGAR, one who exists on charitable contributions. The word is of uncertain origin, but its use in England dates back to the XIII. cent. See **MENDICANCY**.

BEGGAR-MY-NEIGHBOUR, card game, played by two players.

BEGHARDS, lay male confraternity which flourished in Europe XIII. and XIV. cent's; modelled on *Béguines* (q.v.).

BEGONIA, genus of succulent herbs, comprising about 350 species; native of moist tropics.

BÉGUINES, lay sisterhoods founded at Liège about 1170 by a priest named Lambert le Bègue, who devoted his fortune to establishment of church and hospital there; the B. were not required to take vows, but expected to devote their whole time to good works; movement very popular, and spread rapidly. A *Béguinage* at Ghent, at the present time, numbers some hundreds of sisters.

BEGUM, Indian title of honour bestowed on mother, sister, and wife of ruler.

BEHAIM, MARTIN (c. 1436-1507), Ger. navigator and geographer; made globe of world, 1492, kept at Nuremberg.

BEHAR, see **BIHAR**, **BIHAR** AND **ORISSA**.

ADING, see **CAPITAL PUNISHMENT**.

BEHEMOTH, Biblical (*Job* 40¹⁸) animal, probably hippopotamus.

BEHISTUN (34° 8' N., 47° 20' E.), village, Persia; on the face of a steep rock is the remarkable cuneiform inscription in three languages, recording deeds of Darius I.; king of Persia, copied and trans. by Sir Henry Rawlinson (q.v.), 1835-37.

BEHM, DR. ERNST (1830-84), Ger. geographer and statistician; editor of *Mitteilungen*, etc.

BEHN, APHRA (1640-89), Eng. novelist and dramatist; wrote a novel about an African prince named Oroonoko; plays include *The Forced Marriage*, *The Amorous Prince*, *The Town Fop*, etc., distinguished by wit, vivacity, and indecency; employed by Charles II. as a spy in the Netherlands; said to have been the first Eng. professional authoress.

BEHR, WILLIAM JOSEPH (1775-1851), Ger. publicist; was accused of disloyalty to Maximilian I. of Bavaria; author of several works of a socialistic tendency.

BEHRING, see **BEERING**.

BEILAN (38° 30' N., 36° 13' E.), town, N. Syria. Pop. c. 5000. B. Pass connects Syria with Cilicia.

BEILLANY (22° 13' N., 31° 48' E.), town, Lower Nubia, Africa.

BEIRA.—(1) (40° 30' N., 7° 50' W.) province, Portugal; area, 9208 sq. miles. Pop. 1,515,834. (2) (19° 50' S., 34° 55' E.) seaport town, Portug. E. Africa; built on tongue of sand at mouth Pungwe River; nearest port to Mashonaland; B. railway links up with Cape to Cairo line at Bulawayo. Pop. 7200.

BEIRUT, BAYROUT (33° 54' N., 35° 29' E.), vilayet, Syria, stretching along Mediterranean coast; capital and chief town, BEIRUT; centre of transit trade of southern Syria; connected by railway with Damascus; ancient Phœnician town; silk, gold, and silver threads. Pop. c. 119,000.

BEIT, ALFRED (1853-1906), S. African financier; b. Hamburg; associated with Cecil Rhodes in De Beers; partner in firm Wernher, Beit, & Co., and director of the Rhodesia and other railways; founded chair of Colonial History at Oxford (1902), and left large bequests for educational purposes to London Univ., Hamburg, Capetown, and Johannesburg.

BEITH (55° 46' N., 4° 37' W.), town, Ayrshire, Scotland. Pop. (1911) 6699.

BEJA (38° 3' N., 7° 49' W.), town, Alemtejo, Portugal; cathedral; grain, fruit. Pop. 8895.

BEJA, collective name for numerous Hamitic tribes of nomads who, in ancient times, ranged over entire stretch of country between Nile and Red Sea; all Muhammadans, of polygamous habits; noted for physical beauty.

BEJANT, BAJAN (Fr. *bec jaune*), old name for 'freshman,' still used in St. Andrews and Aberdeen Univ's.

BEJAR (40° 20' N., 5° 39' W.), town, Spain. Pop. 9488.

BEJAR, SIERRA DE (40° 17' N., 5° 35' W.), mountain range, Spain.

BÉJART, ARMANDE CLAIRE ELIZABETH (1645-1700), Fr. actress; wife of Molière, who wrote many leading parts for her; outlived Molière and afterwards man actor named Guérin. Her sister, **MADLEINE B.** (1618-72), was also a prominent member of Molière's company.

BEK, THOMAS (d. 1293), Lord Treasurer of England under Edward I.; bp. of St. David's (1280).

BEKE, CHARLES TILSTONE (1800-74), Eng. traveller and author; travelled extensively in Abyssinia, Syria, Palestine, and Egypt; pub. *The Nile and its Tributaries* (1847), *The Sources of the Nile* (1860), *The British Captives in Abyssinia* (1866).

BEKES (46° 47' N., 21° 8' E.), town, Hungary.

BEKESCABA (46° 41' N., 21° 7' E.), market town, Hungary, near White Körös; cereals. Pop. 37,547.

BEKKER, BALTHASAR (1634-98), Dutch theologian; follower of Descartes.

BEKKER, ELIZABETH (1738-1804), Dutch novelist; wrote, in conjunction with Agatha Deken, several novels which achieved popular success.

BEKKER, IMMANUEL (1785-1871), Ger. philologist; pioneer of diplomatic criticism in his editions of Gk. and Lat. classics.

BEL, signifying 'lord' or 'master'; principal Babylonian deity, whose temple was in the sacred city of Nippur; cf. Baal.

BEL AND THE DRAGON, usually considered apocryphal book of Bible, though accepted by Council of Trent (1546) as chapter xiv. of Daniel.

BELA (25° 55' N., 82° 2' E.), town, United Provinces, India; agricultural produce. Pop. 7000.

BELA III. (d. 1196), king of Hungary, s. of Geiza II., grandson of Bela II.; adopted by Manuel, emperor of Constantinople, who afterwards, however, had a son. He succ. as king of Hungary, 1173, on death of his brother Stephen; distinguished by his Byzantine tendencies.

BELA IV. (1206-70), king of Hungary, s. of Andrew II., grandson of Bela III.; succ. in 1235; one of most energetic kings of Hungary; previously headed revolts against oppression of Andrew II., and forced him to sign the Golden Bull, 1222; as king suppressed aristocratic misrule; driven from Hungary by Mongols, 1241, and forced to colonise country on his return.

BELBEIS (30° 24' N., 31° 35' E.), town, Egypt. Pop. 11,267.

BELBEIS, see **BILBEIS**.

BELCHER, SIR EDWARD (1709-1877), Eng. admiral, Arctic explorer, and writer.

BELCHITE (41° 20' N., 0° 50' W.), town, Spain. Pop. 4000.

BELEM.—(1) (38° 41' N., 9° 14' W.) town, Portugal. (2) (7° 8' N., 61° 35' W.) town, Venezuela. (3) (23° 33' S., 57° 8' W.) town, Paraguay. (4) (25° 9' S., 51° 34' W.) town, Brazil. (5) (1° 28' S., 48° 24' W.) town, Brazil. Pop. 100,000.

BELEMNITE, an extinct genus of Cephalopoda (q.v.).

BELFAST.—(1) (54° 36' N., 5° 55' W.) largest town, Ireland; port and great commercial centre of Ulster, on Belfast Lough, 12 miles from Irish Sea; headquarters of linen trade in U.K.; has also great shipbuilding yards, which have produced some of the largest steamships, including *Oceanic* and the ill-fated *Titanic*. Industries include distilling, brewing, iron-founding, flour-milling, making of rope, blacking, sail-cloth, aerated waters; harbour very large and safe; there are four graving docks. There is a R.C. Cathedral; Prot. Cathedral begun in 1899; Univ. (*Queen's Univ.* (1909), founded as Univ. Coll. in 1849), R.C., and two dissenting colleges. Public buildings include magnificent city hall, free library, museum. B. is centre of Prot. anti-Home Rule sentiment in Ireland. Pop. (1911) 385,492. (2) (44° 23' N., 69° 1' W.) seaport, Maine, U.S.A. Pop. (1910) 4618.

BELFORT.—(1) (47° 38' N., 6° 53' E.) territory, E. France, bordering on Alsace; remnant of department Haut-Rhin after cession to Germany, 1871; cereals, iron, machinery, cloth; area, 235 sq. miles. Pop. (1911) 101,000. S. of Voeges lies the pass, *Trouée de B.* (2) (47° 38' N., 6° 53' E.) town, E. France; important strategical position near Ger. and Swiss frontiers; high citadel; belonged for time to Austria, but acquired by France, 1648; fortified by Vauban, 1688; often besieged in wars of XVII. and XIX. cent's; surrendered to Germans after 3 months' siege, Feb. 1871; 'Lion of B.' by sculptor Bartholdi, commemorates siege; fortifications since rebuilt; fine church and town hall; industries include cotton spinning, tanning, brewing, machinery; considerable export and import trade. Pop. (1911) 39,371.

BELFRY (from Ger. *bergfriede*, place of refuge), crenellated portion of church; meaning lost later in sense of bell-tower.

BELGÆ, inhabitants of *Gallia Belgica*, the district of Gaul between the Marne, Rhine, Seine, and North Sea; described by Cæsar as most warlike Germanic people.

BELGARD (54° N., 16° E.), town, Prussia; horse, cattle markets. Pop. 8600.

BELGAUM (15° 50' N., 74° 31' E.), town (and district), Bombay; military cantonment; fort captured by British, 1818; cotton mills. Pop. 36,900. Area of district, 4649 sq. miles. Pop. 994,000.

BELGIAN CONGO, see **CONGO, BELGIAN**.

BELGIOJOSO (45° 9' N., 9° 19' E.), town, Lombardy, Italy, which gives name to family of B. Cristina, PRINCESS OF B. (1808-71), was prominent patriot and author. Pop. 3830.

BELGIUM (49° 30' to 51° 30' N., 2° 30' to 6° 7' E.), kingdom, Europe; bounded N. by Netherlands, E. by Netherlands, Prussia, Luxembourg, S. and S.W. by France, N.W. by North Sea; length, c. 170 miles; width, c. 108 miles; area, 11,373 sq. miles. Surface is flat and low lying except in S.E., where Ardennes rise to 2000 ft.; coast districts in some places below sea-level, protected by sand-dunes and dykes; along Dutch border is marshy tract called Campine, with woodland and good agricultural ground; drained by Scheldt and Maas, with tributaries—of former, Lys, Dender, Durme, Rupel; of latter, Sambre and Ourthe. Climate resembles that of S. of England; rainfall varies from 28 to 40 inches.

History.—Originally B. was inhabited by people of Celtic race, who were expelled by Germans; latter were in turn conquered by Romans, who remained here for several cent's, but were ultimately expelled by Franks; B. formed part of Charlemagne's empire; by Treaty of Verdun in 843 eastern provinces became duchy of Alsace-Lorraine, and western (see **FLANDRES**) fell to France; subsequently various principalities arose, and history was one of factions and rivalries between different families, towns, and provinces. Most of states were ultimately united under dukes of Burgundy, and in 1477 they passed to Hapsburgs by marriage of Mary, dau. of Charles of Burgundy, to Maximilian, who later became emperor. Their son, Philip, governed Netherlands for time, and was succ. by his sister, Margaret of Austria, who was regent from 1507-30; under her nephew, Charles V., emperor and king of Spain, those adopting Reformed religion were persecuted, and country was formally united to Spain; he abdicated in 1555, whereupon his son, Philip II. of Spain, succeeded; he continued persecution of heretics, and during regency of his half-sister, Margaret of Parma, various outbreaks occurred against Span. rule; Alva, sent to reduce rebels, accomplished his task with such cruelty that result was revolt of all Netherlands (q.v.) in 1568; this ended in establishment of northern provinces as kingdom of Holland (q.v.), while southern region (Flanders) remained under Span. control. B. was given to Clara Isabella Eugenia in 1598, by her father, Philip II., on her marriage with Archduke Albert of Austria, at whose death in 1621 it returned to Spain. In later XVII. cent. some provinces were lost to France, but by Treaty of Rastadt in 1714 they passed to Austria. Under Archduchess Marie Elizabeth (1725-41), Charles of Lorraine (1741-80), and Archduchess Marie Christina (1781-92) country enjoyed considerable prosperity; though in 1789 there was revolt, which was suppressed. During Fr. Revolutionary wars Austria suffered many defeats, and in 1814 B. was ceded to France. On fall of Napoleon it was, by treaty of London and Congress of Vienna, united with Holland as kingdom of Netherlands under William of Orange. Result was not satisfactory, and in 1830 an insurrection broke out at Brussels and spread over whole of B., resulting in revolution and separation of B. from Holland once again. Ultimately Leopold of Saxe-Coburg-Gotha was chosen as king of B., and assumed crown in 1831. For some time after this Holland refused to recognise B. as separate kingdom, and sent army to occupy Antwerp; but, owing to Fr. intervention, they had to withdraw in 1832. Leopold I. died in 1865, and was succ. by his son, Leopold II., in whose reign Congo Free State was annexed to B. (see **CONGO, BELGIAN**). He died in 1909, and was succ. by his nephew, the present king, Albert I. The

neutrality of B. is guaranteed by Austria, Russia, Britain, and Prussia by the Treaty of London, 1831.

B. is limited monarchy; Parliament consists of Senate of 110 members and House of Representatives of 166 members (1912).

Resources and Productions.—B. has over 3000 miles of railways; chief railway centres are Malines,

important industrial towns, while Antwerp is one of greatest shipping and manufacturing centres in N. Europe. The country's commercial prosperity is largely due to Leopold I. and Leopold II., the former having had great struggle with commercial conservatism of country. Metal manufactures are valuable and numerous, including machinery, fire-arms, cannon,

wire, gold, silver, tin, brass, and copper goods. Other industries are linens, lace, woollens, carpets, cottons, silk, velvet, hosiery, glass, paper, leather, gloves, sugar, brewing, distilling, fisheries. Chief manufacturing towns besides Antwerp are Liège, Brussels, Ghent. Exports include sugar, glass, cottons, linens, woollens, fruit, flour, oils, coal, coke, grain, chemicals, iron, steel, machinery, diamonds, caoutchouc; imports raw materials for textile trade, hides, rubber, dyes, wine, soap, hops, meat, grain, wheat, coffee, etc.

Population.—In agricultural N. are *Flemings* (Teutonic); in industrial S. are *Walloons* (Latin). Besides Belgians themselves, population consists of Dutch, French, Luxembourg, British, and other European nationalities. B. is one of most densely populated countries of the world (652.9 per sq. mile), hence importance of BELGIAN Congo. Chief religion is Roman Catholicism; there are a few Protestants and Jews. Primary education is free; Brussels and Louvain have free univ's, Ghent and Liège state univ's. French and Flemish are equally spoken. Pop. (1910) 7,423,784.

Boulger, *History of B.* (1900); Williams, *Historians' History of World*, vol. xiii. (1907); Charriant, *La Belgique Moderne* (1910); (Clive Holland, *Belgians at Home* (1911).

BELGRADE (44° 47' N., 20° 26' E.).—(1) capital of Servia, at confluence of Danube and Sava; centre for Servian export trade; unimportant industries; Royal palace, scene of murder of King Alexander and Queen Draga, 1903; B. belonged at various times to Roman and Byzantine empires, Greeks, Bulgarians; taken by Turks, 1521; finally transferred to Ser-

vians, 1867. Pop. (1911) 90,900. (2) department, Servia; area, 782 sq. miles. Pop. (1910) 155,800.

BELGRAVIA, district round B. Sq., London; aristocratic quarter.

BELHAVEN AND STENTON, JOHN HAMILTON, 2ND BARON (1656-1708), Scot. politician and orator.

BELIAL, epithet of Satan in Bible; hence Satan or an evil person.



Brussels. Scheldt and Maas are navigable; many canals. Forests cover about $\frac{1}{3}$ of surface, and about $\frac{1}{3}$ are cultivated; chief crops, wheat, rye, oats, barley, potatoes, beet, hemp, flax, tobacco, hops, chicory, madder. Horses are bred; honey produced, silkworms reared. Minerals include coal, iron, lead, zinc, copper, manganese, calamine. E. and S.E. districts being rich in ores. B. is pre-eminently a manufacturing country, and has many

BELIEF, theological term for assent to a creed. Amount of assurance in b. differs in each individual case, from that of Tenyson, who wrote, 'We have but faith, we cannot know,' to that of the mystic who feels that b. is knowledge, or enjoys conviction as great as that with which he accepts natural phenomena.

BELISARIUS (c. 505-65), general of Byzantine empire; put down Nika revolt at Constantinople, 532; won famous victories against Vandals and Ostrogoths of Africa and Italy; d. in disgrace.

BELIZE, **BALIZE** (17° 29' N., 88° 11' W.), town, Brit. Honduras. Pop. 10,000.

BELL, hollow metal vessel, provided with clapper, by which it is sounded. B's are composed of a mixture of copper and tin (4 to 1), and are cast in the following manner: First an inner core of brickwork is formed, the outside of which is liberally smeared with grease, and upon this structure is moulded a clay model of the intended b. Upon the outside of this clay b. the inscriptions (if any) are moulded in wax, these in their turn being smeared with grease, and then two separate layers of clay are carefully moulded around the inner structure. The entire mass is then baked to the required degree of hardness, during which time the wax and other grease escapes through holes left for that purpose. After this the clay b. is knocked away, and into the space thus left between the outer cops and the original core the necessary amount of molten metal is poured, and the b., when cooled, is complete.

Small b's have apparently been in use from the earliest hist. times, as they have been discovered in ancient Egyptian tombs and in the ruins of Nineveh; the bathing-hour was announced in Imperial Rome by the ringing of a b. In the Brit. Isles b's were in use as early as the VI. cent., the most primitive type consisting of quadrangular plates of hammered iron, riveted together. Benedict Biscop brought a b. from Italy for his abbey at Wearmouth, and a b. called the monk Cadmon to prayers at Whitby Abbey. The Saxons became industrious b.-makers, so much so that England became known as the 'ringing island.' The use of b's in religious buildings is believed to have created the need for steeples, or b.-towers, and so led to the development of one of the most distinctive features in ecclesiastical arch. Before the use of large b's in churches the towers were generally squat and insignificant. As regards the various uses of b's it may be noted that the great b. of a cathedral in mediæval times usually belonged to the burghers, and not to the ecclesiastical authorities.

It used to be the custom to ring the *Passing B.* for the dying, but, by later usage, a muffled b. is rung immediately before funerals. The use of the *Curfew B.* is well known; and the *Sanctus B.*, which was formerly hung in a turret outside the church so that all who heard might prostrate themselves when it was rung during the celebration of Mass.

On board ship b's are rung every half-hour to mark the progress of each watch; thus *two b's* show that an hour of the watch is over. Sets of b's tuned to harmonise form *chimes*. Fact of vibrations of b's has been utilised for signalling at sea in fogs, etc., the b's being fixed below deck. The largest b. known is the great b. of Moscow, cast in 1733, but never hung, having been cracked in the making. It weighs 198 tons, is 19 ft. in height, and is now used as a chapel. Another Moscow b., in present use, weighs, 128 tons. There are also enormous b's to be seen in Burma, Pekin, Cologne, Vienna, and Paris. In England the largest b's are St. Paul's, 16 tons; 'Big Ben,' Westminster, 13½ tons; 'Great Peter,' York, 12 tons; 'Great Tom,' Oxford, 8 tons.

North's *English Bells and Bell Lore* (1888); Raven's *Bells of England* (1906).

BELL, BOOK, AND CANDLE, objects which figure in papal excommunication; sentence closes with words, 'shut the book, extinguish the candle, ring the bell.'

BELL (or **INCHCAPE**) **ROCK** (56° 26' N., 3° 23' W.), reef surmounted by a lighthouse in German Ocean, off coast of Forfarshire, 11½ miles S.E. of Arbroath. The name refers to an old tradition made popular in Southey's ballad, *The Inchcape Rock*.

BELL, ACTON, CURREN, AND ELLIS, see **BRONTË**.

BELL, ALEXANDER MELVILLE (1819-1905), Amer. educationist; b. Edinburgh, Scotland; lectured on Elocution at univ's of Edinburgh and London; became lecturer on philology at Kingston (Ontario) and Washington, D.C., successively. His son, Alexander Graham Bell (1847-), Amer. physicist and physiologist; b. and ed. Edinburgh, Scotland; inventor of telephone (q.v.), photophone, and a phonograph.

BELL, ANDREW (1753-1832), Scot. c. and educationist; b. St. Andrews; went to Madras as army-chaplain (1787), and two years later was app. head of the Male Orphan Asylum there, where he introduced the system of education by pupil teachers. Upon his return to England the 'Madras system' was adopted by others, and soon became popular; given prebend of Westminster; buried in the Abbey.

Southey, *Life of Dr. Bell*.

BELL, SIR CHARLES (1774-1842), Scot. anatomist and surgeon; bro. of JOHN B., anatomist, and GEORGE B., jurist; practised in London; prof. of Surgery in Edinburgh; gained international fame owing to his discovery of existence of distinct sensory and motor nerves; author of several works on anat. and surgery.

BELL, GEORGE JOSEPH (1770-1843), Scot. jurist; author of *Law of Bankruptcy* (1804), *Commentaries on the Law of Scotland* (1826), and other legal works.

BELL, HENRY (1767-1830), Scot. engineer; built first Brit. steamboat, the *Comet* (1812).

BELL, HENRY GLASSFORD (1803-74), Scot. advocate and author; editor of *Edinburgh Literary Journal* (1828).

BELL, JACOB (1810-59), Eng. pharmacist, founder of the Pharmaceutical Society of Great Britain (incorporated 1843) and of the *Pharmaceutical Journal*.

BELL, JOHN (1796-1869), Amer. politician; foremost opponent of secession of southern states, 1860; gave his name to southern constitutional party.

BELL, JOHN (1691-1780), Scot. physician and traveller; travelled extensively in Russia, Turkey, and Asia with Russ. embassies; physician to Peter the Great on expedition to Caspian Gates.

BELL, JOHN (1763-1820), Scot. surgeon and anatomist; was lecturer on anat. in Surgeon's Hall, Edinburgh (1790), and practised as surgeon.

BELL, JOSEPH (1837-1912), Scot. surgeon; editor (1873-96) *Edinburgh Medical Journal*; surgeon and teacher of surgery, Royal Infirmary, Edinburgh; the original of 'Sherlock Holmes,' whose methods were based on B.'s methods of diagnosis.

BELL, ROBERT (1800-67), Irish author; pub. annotated edition of the *English Poets*, with memoirs (24 vols., 1854-57), completed Southey's *Lives of the British Admirals*, and was associated with various other works.

BELLADONNA, **DEADLY NIGHTSHADE**, plant, *Atropa belladonna*, of natural order *Solanaceæ*, the leaves and roots of which are used as a drug in med. because of the alkaloids contained, *atropine* being the most important. B. is used externally for relieving pain, e.g. in neuralgia or osteo-arthritis, or for preventing the secretion of milk in the breasts of women unable to nurse their children, or, usually as a solution of atropine sulphate, for dilating the pupil in ophthalmic practice. Internally B. is used in asthma, whooping-cough, etc., for relieving the spasm and decreasing the excessive secretion; and also for relieving nocturnal incontinence of urine. In cases of B. poisoning stimulants, e.g. strychnine, etc., hot strong coffee, or caffeine in large doses should be given, and artificial respiration should be resorted to, as the poisoning depends on the action of B. in stopping the action of the heart and lungs.

BELLAGGIO (45° 58' N., 9° 16' E.), town, Italy. Pop. 3536.

BELLAIRE (40° 2' N., 80° 47' W.), town, Ohio, U.S.A. Pop. (1910) 12,946.

BELLAMY, EDWARD (1850-98), Amer. author; ed. for Bar, but became a journalist; famous as the author of *Looking Backward, 2000-1887* (1888), a Socialistic tract in form of a romance.

BELLAMY, GEORGE ANNE (1727-88), Eng. actress; natural dau. of Lord Tyrrawley, ambassador at Lisbon; adopted the stage, and was associated with many of Garrick's triumphs at Drury Lane; pub. an *Apology* in 6 vols. (1785) for her irregular life.

BELLAMY, JACOBUS (1757-86), distinguished Dutch poet.

BELLAMY, JOSEPH (1719-90), Amer. theologian; Congregational pastor at Bethlehem, Connecticut; popular preacher with powerful influence on religious thought of time.

BELLARMINI, ROBERT FRANCIS ROMULUS (1542-1621), Ital. cardinal; b. Monte Pulciano; entered Society of Jesus (1560); made cardinal (1599); abp. of Capua (1601), but resigned, 1605; became later abp. of his native town; led life of strict asceticism; famous controversialist and theologian; a prolific writer upon many religious subjects.

BELLARY, BALLARI (15° 8' N., 76° 50' E.), town, Madras, India; upper fort, on high rock, used as prison; lower fort has barracks; trades in cotton. Pop. 58,247. District produces cotton, cereals. Pop. 947,214.

BELLAY, GUILLAUME DU, SIEUR DE LANGEY (1491-1543), Fr. diplomatist; served Francis I. of France; also historian of merit; sympathised with the Reformers; friend of Rabelais. Bellay, Jean du (c. 1493-1560), younger bro. of Guillaume, diplomatist; cr. cardinal, 1535; bp. of Ostia; dean of Sacred Coll., 1555; of liberal views; wrote Latin verse.

BELLAY, JOACHIM DU (1522-60), Fr. poet and critic; formed a close friendship with Ronsard, and through him became associated with other poets in founding the *Pléiade* (see RONSARD). His critical writings are of high quality (e.g. *Défense et Illustration de la Langue française*), and in poetry he ranks next to Ronsard. Hilaire Belloc, *Avril*.

BELL-BIRD, popular name of various kinds of birds which have bell-like note, such as Australian *Manorhina*, New Zealand Honey-Sucker, *Anthornis*, S. Amer. Chatterer—*Oasmorhynchus*.

BELLE ISLE, STRAIT OF (51° 30' N., 57° W.), channel, separating Labrador from Newfoundland; midway lies island of B. I.

BELLE-ALLIANCE, LA, farm on field of Waterloo (q.v.).

BELLEAU, REMI (d. 1577), Fr. poet; friend of Ronsard; one of *Pléiade* (q.v.), famous for his exquisite lyrics; wrote *La Bergerie*, a pastoral romance, in verse and prose.

BELLEFONTAINE (40° 21' N., 83° 47' W.), town, Ohio, U.S.A. Pop. (1910) 8238.

BELLEGAARDE, HEINRICH JOSEPH JOHANNES, COUNT VON (1756-1845), Austrian diplomatist and general; won great successes in Italy.

BELLE-ÎLE-EN-MER (47° 20' N., 3° 10' W.), island, west Fr. coast. Pop. 9703.

BELLE-ISLE, CHARLES LOUIS AUGUSTE FOUQUET, DUC DE (1684-1761), Fr. general and diplomatist; distinguished himself in wars of Spain and Polish successions; made marshal of France, 1741; cr. duke and peer of France, 1748.

BELLENDEN, JOHN (d. 1587), Scot. historian; in service of James V., at whose desire he trans. Boccaccio's *Historia Scotorum*, pub. 1536 as *The History and Chronicles of Scotland*, a fine example of Scot. prose.

BELLENDEN, WILLIAM (b. 1555), Scot. classical scholar; patronised by King James; noted authority on life and writings of Cicero.

BELLEROPHON (classical myth.), s. of Poseidon; famous for slaying monster, Chimera, which he attacked upon his winged horse, Pegasus (q.v.).

BELLES-LETTRES (Fr.), the literature of art as opposed to the literature of science; used generally of literary writing; term first employed in England during first decade of XVIII. cent.

BELLEVILLE.—(1) (44° 11' N., 77° 27' W.) port of entry, Ontario, Canada; cheese. Pop. 9117. (2) (38° 27' N., 80° 57' W.) city, Illinois, U.S.A.; factories. Pop. (1910) 21,122.

BELLEY (45° 46' N., 5° 40' E.), town, Ain, France; ancient cathedral; lithographic stones. Pop. 6500.

BELL-FLOWER, see CAMPANULA.

BELLIGERENCY, state of carrying on war (q.v.) under conditions of international law.

BELLINGHAM (48° 45' N., 122° 42' W.), city and port, Washington, U.S.A.; railway terminus; saw-mills. Pop. (1910) 24,298.

BELLINGHAM, SIR EDWARD (d. 1549), Deputy-Gov. of Ireland who strengthened Eng. rule there.

BELLINI, GIOVANNI (1430-1516), Ital. artist; s. of Jacopo B. (c. 1400-70), and younger bro. of Gentile B. (c. 1430-1507), all distinguished artists, and founders of the great XV.-cent. Venetian school. The f., who was s. of a pewterer, became pupil of Pisanello and Fabriano, and one of the most successful portraitists of his age. Gentile, who, together with Giovanni, had assisted the elder B. in some of larger works for public buildings, early established wide reputation for his individual work. He spent some considerable time in Constantinople at the invitation of Muhammad II., whose portrait he painted. Examples of his work are to be seen in the Louvre and the National Gallery, London; much of his work done for Venetian buildings was unfortunately destroyed by fire in 1577. Giovanni, however, was the most distinguished member of the family, and after serving as his f.'s assistant at Venice and Padua till nearly thirty years of age, became the greatest Ital. artist of the XV. cent. Much of his work, also, has been destroyed by fire, but several fine examples, including *Loredano, Doge of Venice*, are in the National Gallery, London. His success was such that for many years before his death B. was compelled to decline a great number of commissions; Dürer, who met him in 1506, when he was at the height of his fame, speaks of his generosity and kindness to all members of his craft; amongst his pupils were Titian and Giorgione. See PAINTING.

R. Fry, *Giovanni Bellini* (1899); Hay, *Bellini* (masterpieces in colour).

BELLINI, VINCENZO (1801-85), Sicilian composer; b. Catania; studied at Naples; first operas, *Adelson e Savina* (1825) and *Bianca e Fernando* (1826), were both produced at Naples; *Il Pirata* (1827), produced at Milan, was his first distinct success, and was followed by his masterpieces, *I Montecchi e Capuleti* (1830), *La Sonnambula* (1831), *Norma* (1831), and *I Puritani* (1835), now seldom performed, though distinguished by delicacy and melodiousness.

BELLINZONA (46° 11' N., 9° 1' E.), town, Ticino, Switzerland, on St. Gotthard railway; formerly fortified; three castles. Pop. c. 5000.

BELLMAN, KARL MIKAEL (1740-95), Swed. poet; famous for songs and odes; pub. *Fredmans Epistlar* (1790), *Fredmans Sanger* (1791), *Bacchi Tempel, Zion's Högtid*, etc.

BELLO, ANDRÉS (1781-1865), Venezuelan poet and scholar.

BELLOC, HILAIRE (1870-), Eng. (Liberal) politician and author of poems, satirical novels, books of travel, etc.; polished style.

BELLO-HORIZONTE (20° 1' S., 44° 17' W.), city, Brazil. Pop. c. 30,000.

BELLONA (classical myth.), goddess of war; war personified.

BELLOT, JOSEPH RENÉ (1826-53), Fr. sailor; joined Franklin search expeditions (1851-52), and discovered 'Bellet Strait' (72° N., 94° 40' W.), in Brit. N. America.

BELLOWS, see BLOWING MACHINES.

BELLOWS, HENRY WHITNEY (1814-82), Amer. Unitarian divine; popular preacher and writer; minister in New York, 1839-82.

BELLOY, PIERRE LAURENT BUIRETTE DE (1727-75), Fr. dramatist; author of *Zelmire* (1762), *Le Siège de Calais* (1765), *Pierre le Cruel*, *Gabrielle de Vergy*, and other pieces.

BELL-THE-CAT, see DOUGLAS, ARCHIBALD.

BELLUNO (46° 8' N., 12° 14' E.), town and province, N. Italy; cathedral; silk. Pop. 6900.

BELMEZ (38° 16' N., 5° 17' W.), town, Spain. Pop. 8978.

BELOIT (42° 30' N., 89° 3' W.), city, Wisconsin, U.S.A.; college; factories. Pop. (1910) 15,125.

BELOMACY, ancient form of divination with arrows (*Ezekiel* 21²¹).

BELON, PIERRE (1517-64), Fr. naturalist and traveller; pioneer in science of comparative anatomy.

BELPASSO (37° 33' N., 14° 58' E.), town, Sicily. Pop. 9460.

HELPER (53° 2' N., 1° 29' W.), market town on Derwent, Derbyshire, England; cotton. Pop. (1911) 11,900.

BELSHAM, THOMAS (1750-1829), Eng. divine; became Unitarian, 1789; able thinker and writer; minister in London from 1805.

BELSHAZZAR (VI. cent. B.C.), Babylonian general, identified by modern scholars as s. of King Nabonidos, not of King Nebuchadnezzar, as stated in *Book of Daniel*; made last resistance of Babylonia to Cyrus; Bible story of B.'s feast is thought apocryphal.

BELT, GREAT (55° 30' N., 10° 50' E.), strait, Denmark, between Zealand and Fünön.

BELT, LITTLE (55° 12' N., 9° 53' E.), strait, Denmark, between Fünön and Jutland.

BELT, THOMAS (1837-78), Eng. geologist, investigated gold-bearing rocks in Australia, Nova Scotia, and Nicaragua; pub. papers on Glacial period.

BELTANE, Celtic festival associated with May-Day, supposed to be derived from the Druidical worship of the sun-god. Mention is made of it as early as the beginning of X. cent. by Cormac, abp. of Cashel. It was the custom to light 'beltane fires,' at which 'beltane cakes' were baked, and certain usages were observed in the distribution of these cakes amongst the company.

BELTRAMI, GIULIO CESARE (1779-1855), Ital. patriot, explorer, and author; discovered sources of Mississippi.

BELUCHISTAN, see BALUCHISTAN.

BELUGA, WHITE WHALE (*Delphinapterus leucas*), Arctic Delphinid cetacean. See DOLPHIN FAMILY.

BELVEDERE ('beautiful view'), Ital. building with fine view; the b. formerly part of Vatican, Rome, gave name to *Apollo B.*

BELVIDERE (42° 16' N., 88° 47' W.), city, Illinois, U.S.A.; factories. Pop. (1910) 7253.

BELZONI, GIOVANNI BATTISTA (1778-1823), Ital. traveller, engineer, antiquarian; went to Egypt, 1815, to construct a hydraulic machine for Mehemet Ali; later studied Egyptian antiquities, opened second pyramid of Gizeh, and searched for the ruins of the temple of Jupiter Ammon. Many of the antiquities found by him are in the British Museum; pub. *Excavations in Egypt and Nubia* (1821); d. during a journey to Timbuktü.

BEM, JOSEPH (1795-1850), Polish soldier; as leader of the Hungarian insurgents won many victories over Austrians; later entered Turk. service, embraced Islamism, and performed brilliant services in suppressing Arab insurrections.

BEMBERG, HERMAN (1861-), Fr. composer; opera *Elaine* produced at Covent Garden, 1892.

BEMBO, PIETRO (1470-1547), Ital. cardinal; b. Venice; app. historiographer at Venice (1529), and afterwards librarian of St. Mark's; secured a cardinal's hat from Paul III. (1539). He was famous

for his learning, and became one of the most elegant writers of the Tuscan school.

BEMBRIDGE BEDS, Oligocene fluvio-marine deposits with Osborne beds below and Hampstead beds above, Isle of Wight and Hampshire.

BEMIS, EDWARD WEBSTER (1860-), Amer. economist; pub. *History of Co-operation in the United States* (1888), *Municipal Monopolies* (1899), etc.

BEN.—(1) In Scot. two-roomed cottage ('a but and a ben') the kitchen, or outer room, is known as the *but*, the inner chamber, opening from the kitchen, the *ben*. (2) Gaelic for mountain, e.g. Ben Nevis. (3) Arab. and Hebr. for s. of, e.g. Rabbi ben Ezra, Benjamin.

BEN LEDI (56° 16' N., 4° 21' W.), mountain (2875 ft.), beside Loch Lubnag, S.W. Perthshire, Scotland.

BEN LOMOND (56° 11' N., 4° 37' W.), mountain (3192 ft.), E. side of Loch Lomond, N.W. Stirlingshire, Scotland.

BEN MACDHUI (57° 4' N., 3° 43' W.), mountain (4296 ft.), Cairngorm range, S.W. Aberdeenshire, Scotland.

BEN NEVIS (56° 48' N., 5° W.), mountain, S.W. Inverness-shire, overlooking Fort William; highest peak (4406 ft.) in Brit. Isles, observatory on top now closed.

BEN VENUE (56° 13' N., 4° 26' W.), mountain (2393 ft.), in Trossachs, S.W. Perthshire, Scotland; overlooking Loch Katrine.

BENARES (25° 19' N., 82° 56' E.).—(1) city, United Provinces, India, on Ganges; labyrinth of narrow streets; many temples, mosques, shrines, palaces; notable buildings are Mosque of Aurangzeb and Golden Temple and old Observatory. From remotest ages B. has been Hindu Holy City, and centre of Brahminical learning; annually visited by innumerable pilgrims who come to bathe in sacred river; commercial centre; manufactures brocade, gold filigree, silver and brass work. Pop. (1911) 203,804. Pop. of district, 882,084; of division, 5,069,020. (2) native state; cr. 1911; area, 887 sq. miles. Pop. 362,000.

BENAVENTE (42° N., 5° 40' W.), town, Spain. Pop. 4959.

BENAVENTE (38° 56' N., 8° 46' W.), town, Portugal. Pop. 3550.

BENBECULA (57° 26' N., 7° 18' W.), island and strait, Hebrides, Scotland.

BENBOW, JOHN (1653-1702), Eng. vice-admiral; s. of a Shrewsbury tanner; rose in Navy to highest rank. William III. had immense faith in 'honest B.' and sent him in 1701 as commander-in-chief to the West Indies. On Aug. 19, 1702, when cruising off Santa Marta, he gave chase in flagship *Breda* to Fr. squadron under Du Casse. His captains were mutinous; without their aid he maintained a running fight for four days; right leg shattered by a chain-shot, but he continued to direct from a basket on the poop; eventually d. of his wounds.

BENCH, word used to signify legal or political body, as King's B. (or Queen's B. when queen is reigning), Treasury B., etc.; 'board' has received similar transference of meaning.

BENCOLEN, BENKULEN (3° 50' S., 102° 25' E.), district, Sumatra. Pop. c. 204,269.

BEND, curvature in a road or river; nautical term, meaning to attach, such as 'bending' a cable on to an anchor; in heraldry, a band crossing the shield diagonally from right to left; when drawn in the opposite direction it is termed a 'bend sinister.' A diminution of this latter mark constitutes a 'baton sinister,' the sign of illegitimacy.

BENDA, GEORG (d. 1795), Ger. composer; famous for musical melodramas *Ariadne auf Naxos*, *Medea*, and *Zaide*.

BENDEMANN, EDUARD (1811-89), Ger. historical painter employed in royal palace at Dresden, etc.

BENDER, BENDERAY (46° 47' N., 29° 32' E.), town, Bessarabia, Russia; Charles XII. besieged B. after *Pultowa* (q.v.); brick-kilns. Pop. 33,700.

BENDER ABBAS, see BANDER ABBAS.

BENDER-I-GEZ (36° 50' N., 54° 10' W.), port, Persia.

BENDIGO (36° 45' S., 144° 18' E.), town, Victoria, Australia. Pop. (1910) 42,000.

BENDIN (50° 19' N., 19° 14' E.), town, Poland, Russia. Pop. 45,716.

BENDL, KAREL (1838-97), Bohemian composer.

BENEDEK, LUDWIG VON (1804-81), Austrian general; won distinction in suppressing the revolt in Galicia (1846), afterwards performing brilliant service in various battles in Italy and Hungary (1849-59); gov. of Hungary (1860); commander-in-chief at Venice (1861); suffered a crushing defeat by the Prussians at *Sadowa*, 1866.

BENEDETTI, VINCENT, COUNT (1817-1900), Fr. diplomatist; ambassador at Berlin during last years of Second Empire, and was concerned in the declaration of war against Prussia (1870); pub. *Ma Mission en Prusse* (1871), *Essais Diplomatiques* (1895-97), both of which bear upon Bismarck's diplomacy.

BENEDICITE, first word of Lat. version of the *Cantic of the Three Children* (Apocrypha), and of the Lat. Grace used in R.O. institutions, which it is accordingly used to describe.

BENEDICT, name of fourteen popes. Of the first nine popes and one anti-pope (B. X., 1058) little of importance is known, save that one (B. II., 684) was noted for holiness of life, and is reputed a saint, and one for dissoluteness of life (B. IX., 1033). He was driven out of Rome, and resigned the Papacy several times, and at length retired to a monastery. B. XI. (1303-4), Nicholas Bocassini, a Dominican; wrote scriptural commentaries; is beatified. B. XII. (1334-42), Jacques Fournier, a Cistercian; an able theologian; wished to restore Papacy to Rome, and tried to unite the Gk. and Lat. Churches. B. XIII. (1724-30), Pietro Orsini, became a Dominican in spite of family opposition; made cardinal at 23; made pope against his will; ruled with piety and vigour. B. XIV. (1740-58), Prospero Lambertini, an able theologian and canonist, left a work on canonisation, which is still authoritative.

The anti-pope Pedro di Luna (q.v.) was known as B. XIII.

BENEDICT BISCOP (d. 690), Eng. abbot; founded monastery at Jarrow; teacher of Bede.

BENEDICT, SIR JULIUS (1804-85), musical composer; b. Stuttgart; settled in London, 1835; associated with grand opera at Drury Lane and other theatres. His own operas include *The Lily of Killarney*, *The Crusaders*, *The Bride of Venice*, etc.; and he composed besides numerous oratorios, cantatas, and operettas; knighted, 1871.

BENEDICT OF NURSIA, ST. (c. 480-c. 545), author of monastic Rule of St. B., mild, according to the ideas of the time. See **BENEDICTINES**.

BENEDICTINE, liqueur prepared at Fécamp, France.

BENEDICTINES ('BLACK MONKS'), so called after St. Benedict of Nursia, who established monasteries at Subiaco, Monte Cassino (famous in annals of monasticism), and, before his death, twelve other places. When Monte Cassino was taken by the Lombards (c. 590) the monks migrated to Rome. To this Order belonged St. Augustine, who evangelised England; offshoots were planted in Gaul and Germany; and by the VIII. cent. St. Benedict's was the chief monastic rule in Europe. B's, besides Christianising England and the Slavonic and Scandinavian peoples, did much educational work; they had many schools in the Middle Ages, as they have to-day. In the IX. cent. their great monastery of Cluny (France) became of enormous importance in Europe, and lesser houses were subordinated to it. New orders, among them the Cistercians, adopted the B. rule. The Lateran council of 1215 decreed that B. houses should be federated in provincial chapters. During the later Middle Ages the B. houses degenerated, particularly the convents for women, but reform came with the Council of Trent and the Counter Reformation. There are now in England

several large abbeys, a priory, and a nunnery. In France an important congregation, called the Maurists, was established in 1621, at St. Maur, and other B. monasteries associated with it. They are specially known for their hist. work, being initiators of hist. research in France. Before their dispersion at the Revolution they had issued several hundred volumes, many of them works of the Fathers, besides Biblical, hist., and monastic collections.

Montalembert, *Monks of the West*; Gasquet, *English Monastic Life*; Eichenstein, *Women under Monasticism*.

BENEDICTION (Lat. *benedictio*, blessing), ecclesiastical term for the blessing either of persons or of things. Among Protestants it is generally limited to the b. of the congregation by the minister at the close of the service, but among Catholics it is much more widely used. All sorts of things, water or oil used in worship, and places or buildings for purely secular use, receive b. Catholic b. is sacramental and believed to guard specially against evil spirits.

BENEDICTUS (d. 1194), abbot of Peterborough (1177-94); caused *Gesta Henrici Regis Secundi* to be copied; wrote two works on Becket.

BENEDICTUS, Lat. name for hymn of Zacharias in *Luke* 1st.

BENEDIX, JULIUS RODERICH (1811-73), Ger. dramatist; author of *Das vernünftige Haupt*, *Dr. Wespas*, *Der Vetter*, *Das Lügen*, *Die Diensthofen*, and many other plays.

BENEFICE (Lat. *beneficium*, benefit).—(1) estate granted for life under Roman Empire and in early Middle Ages. (2) estate granted to clergy, settled on themselves and successors. The patron of the b., i.e. the donor of the estate or purchaser of the advowson, presents a clerk to the bp., who institutes him to his office; or if the bp. is patron he collates a clerk of his own choice to the b.

BENEFIT OF CLERGY, exemption claimed by priesthood from the jurisdiction of the secular courts in charges of felony. In XV. cent. exemption was extended to laymen also who were 'clerks'; privilege abolished, 1827.

BENEKE, FRIEDRICH EDUARD (1798-1854), Ger. philosopher; his views were strongly opposed to those of Hegel and Kant; he held that empirical psychology forms the basis of all philosophy, and that mental phenomena are to be treated by generic methods. He was prof. of Philosophy at Berlin for 1832; pub. *Erkenntnislehre* (1820), *Lehrbuch der Psychologie als Naturwissenschaft* (1833).

BENETT, ETHELDRED (1776-1845), one of first Eng. woman geologists; authority and writer on Wiltshire fossils.

BENEVENTO (41° 7' N., 14° 45' E.), town (and province), Italy; abp.'s see; part of papal domain, 1053; conquered by French, 1798; restored to Pope, 1815; united with Italy, 1860; magnificent triumphal arch of Trajan, built 114, is a gate of city. Pop. 17,200.

BENEVOLENCE, name given to forced loan levied by Eng. crown without consent of Parliament; against provision of Magna Carta, and declared illegal by Petition of Right, 1629, and Bill of Right, 1689.

BÉNÉZET, ANTOINE (1713-84), American who agitated for Negro Emancipation.

BENFEY, THEODOR (1809-81), Ger. philologist; pub. *Sanskrit-English Dictionary* (1866), *Manual of Sanskrit*, and other works.

BENGAL (23° N., 89° E.), Presidency of 'Fort William in Bengal'; created a Governorship, 1912; includes deltas of Ganges and Brahmaputra and alluvial plains along their courses; area, 70,000 sq. miles; bounded N. by Sikkim, Bhutan, E. by Assam, Upper Burma, W. by Bihar and Orissa, S. by Bay of Bengal; divided into Presidency, Burdwan, Darjeeling, Chittagong, Dacca, and Rajshahi divisions. B. came into hands of E. India Co., 1756; transferred to Brit. crown, 1858; divided into two provinces—(1) B. and (2) Eastern B. and Assam—1905; owing to political

unrest reconstituted, 1912. Thanks to heavy rainfall and moist, warm atmosphere, production is enormous; mainly rice, but also pulse, indigo, opium, sugar-cane, oil-seed, cotton, ginger, pepper, tea, cinchona, spices, tussore silk, timber, etc.; great mineral wealth—coal, iron, saltpetre; manufactures, cottons, jute fabrics, gunny bags, silk, canvas, muslin, pack-thread; good communications by rail and river. Capital is Calcutta; secondary capital, Dacca.

Administration is carried out by gov. assisted by executive council of three members and legislative council of 50 members.

Inhabitants are of many races; majority of Hindu religion, Muhammadanism next in numerical importance. Pop. c. 42,000,000.

BENGAL BAY OF (16° N., 88° E.), triangular portion, Indian Ocean, between India and Burma.

BENGALI is the Eng. name of *Banga-Bhāṣā*, one of the four principal languages of India, spoken by about 45,000,000 people, mainly in the extensive district of the Lower Ganges. One of the earliest writers in this language was the poet Candī Dās (end of XIV. cent.), who established a school of poets devoted to the honour of Krishna.

BENGAZI (32° 6' N., 20° 20' E.), seaport, N. Africa; good roadstead but harbour shallow; starting-point for caravans trading with interior; exports oxen, sheep, and sponges. Pop. 35,000.

BENGEL, JOHANN ALBRECHT (1687–1752), Ger. Lutheran theologian; studied at Tübingen; preceptor of a theological coll. at Denkendorf, 1713–41; pub. edition of New Testament, the outcome of his critical studies on the text, 1734, and his *Gnomon Novi Testamenti* (still very valuable), 1742.

BENGUELLA (12° 42' S., 13° 8' E.), seaport, Angola, W. Africa; exposed roadstead about a mile from shore; exports amber, rubber, ivory; connected by rail with Lobito Bay, whence railway to interior is being built.

BENI (11° S., 66° 10' W.).—(1) department, N.E. Bolivia, S. America; fertile country; cocoa, hides; area, 102,100 sq. miles; pop. (1910) 37,300. (2) river, Bolivia; rises La Paz; joins the Mamoré.

BENI CARLO (40° 26' N., 0° 25' E.), town, Spain; wines. Pop. 7251.

BENICIA (38° 7' N., 122° 4' W.), town, California; arsenal of U.S.A. Pop. (1910) 2360.

BENI-HASSAN, SFROS ARTEMIDOS (27° 53' N., 30° 56' E.), village, Upper Egypt; numerous tombs with paintings of very early period.

BENI-ISRAEL (sons of Israel), Jewish people settled for cent's on Malabar coast.

BENIN (6° 30' N., 5° 40' E.), part of Southern Nigeria; lies to W. of Niger R.; produces rice and other economic plants; exports great quantities of palm oil. In E. is capital, **BENIN** (6° 20' N., 5° 30' E.), where is Brit. residency. Chief river, **BENIN** (5° 50' N., 5° 20' E.), flows to Atlantic. B. first discovered by Portuguese, XV. cent.; French and Dutch afterwards made settlements here; for time centre of slave trade; under Brit. protection since 1897.

BENI-SUEF (29° 9' N., 31° 13' E.), town, Egypt. Pop. 23,357.

BENITOITE (BaTiSi₃O₉), colourless or bluish gem stone, hexagonal crystals, discovered in California.

BENJAMIN, in Old Testament the youngest s. of Jacob; specially beloved by his f.; his mother Rachel d. in giving him birth; traditional founder of tribe of B., within territories of which lay Jerusalem and other famous towns; among its members were King Saul, Jeremiah, and St. Paul.

BENJAMIN, JUDAH PHILIP (1811–84), Anglo-Amer. lawyer and politician; compiled digest of cases of New Orleans and Louisiana; Confederate Sec. of State (1862–65); Q.O. (1872).

BENJAMIN OF TUDELA (fl. XII. cent.), Jewish rabbi and traveller in East; his account of his journeys is valuable.

BENJAMIN, PARK (1849–), Amer. lawyer

and author; joint editor of *The Scientific American* (1872–8); author of *History of Electricity*, etc.

BENLOWES, EDWARD (d. 1676), Eng. minor Caroline poet.

BENNETT, CHARLES EDWIN (1858–), Amer. classical scholar; Latin prof., Cornell Univ.

BENNETT, ENOCH ARNOLD (1867–), Eng. novelist and playwright; stories realistic studies of social life in Potteries; plays include *What the Public Wants* (1909); *Milestones* (with Edward Knoblauch, 1912).

BENNETT, JAMES GORDON (1794–1872), Scots-Amer. journalist; founder and editor of *New York Herald* (1835). His son, **James Gordon Bennett** (1841–), succ. his f. in the control of his newspaper; further known for association with foundation of the Commercial Cable Co., Stanley's search for Livingstone, the Jeannette polar expedition, and as the donor of cups for automobile and balloon races.

BENNETT, JOHN HUGHES (1812–75), Eng. physician and physiologist; prof. of Physiology at Edinburgh (1843); made valuable original observations in physiology and med.; author of many medical works.

BENNETT, SIR WILLIAM STERNDAL (1816–75), Eng. composer; prof. of Music at Cambridge (1856); principal of Royal Academy of Music (1866); composed two cantatas, *The May Queen* and *The Woman of Samaria*, besides numerous symphonies, overtures, concertos, etc.

BENNIGSEN, LEVIN AUGUST, COUNT VON (1745–1826), distinguished Russ. general; led most successful charges, culminating at Leipzig, against Napoleon.

BENNIGSEN, RUDOLF VON (1824–1902), Ger. politician; founded National Association to secure constitutional freedom of Hanover, and afterwards National Liberal Association in Prussia.

BENNINGTON (42° 40' N., 73° 18' W.), town, Vermont, U.S.A.; Americans defeated British near here, 1777. Pop. (1910) 8698.

BENNO (1010–1106), bp. of Meissen and Church reformer; canonised 1523.

BENOÎT DE SAINTE-MAURE, XII. cent. Fr. trouvère, who wrote a verse chronicle of the Dukes of Normandy, from Rollo onwards, in some 40,000 lines.

BENOIT, PETER LEONARD LEOPOLD (1834–1901), Flemish composer; attempted unsuccessfully to found a distinctly Flemish school of music; composed operas, oratorios, cantatas, etc.; his oratorio *Lucifer* was produced in London (1888).

BENSARADE, ISAAC DE (1613–91), Fr. poet; author of *Cléopâtre* (1635), a tragedy, *Métamorphoses d'Ovide* (1676), rendered in form of rondeaux. B. enjoyed the patronage of Richelieu and Anne of Austria; chief employment writing words for court ballets.

BENSON, EDWARD WHITE (1829–96), abp. of Canterbury; b. Birmingham; s. of E. W. Benson, manufacturing chemist; ed. King Edward VI.'s School, Birmingham, and Trinity Coll., Cambridge; first headmaster of Wellington Coll.; prebendary of Lincoln (1868); bp. of Truro (1877); abp. of Canterbury (1883); B., besides being a good scholar, was a man of very devout life, and in his Primacy showed great activity. His eldest s., **ARTHUR CHRISTOPHER BENSON** (1862–), is distinguished as an essayist, critic, and poet; his 3rd s., **EDWARD FREDERICK BENSON** (1867–), is a successful author of satirical novels of fashionable life; his 4th s., **ROBERT HUGH BENSON** (1871–), a R.C. priest, is also an author of note, best known for novels of a strongly mystical type.

A. C. Benson, *Life of Archbishop Benson* (1899).

BENSON, FRANCIS ROBERT (1858–), Eng. actor; gained distinction at Oxford as athlete and amateur actor; took over Walter Bentley's Shakespeare repertory company, 1883, and has since toured under his own name; has managed the Stratford-on-Avon festivals since 1888; has done more to popularise Shakespeare and the legitimate drama than any Eng. actor of modern times.

BENSON, GEORGE (1699-1762), Eng. dissenting minister; held Socinian views.

BENT GRASS (*Agrostis*), genus of grass, with numerous species, distinguished by open panicle and small spikelets with only one flower each.

BENT, JAMES THEODORE (1852-97), Eng. author and traveller; with his wife made extensive journeys in Italy, South Africa, Asia Minor.

BENTHAM, GEORGE (1800-84), Eng. botanist, nephew of Jeremy B.; ed. in France; called to Bar; author of important work on logic, numerous botanical papers, and, in collaboration with Sir Joseph Hooker, of *Genera Plantarum*, a masterpiece of systematic bot.

BENTHAM, JEREMY (1748-1832), Eng. writer on law and political economy; son of attorney; b. Houndsditch; called to Bar but refused to plead; gave himself up to philosophical writing, publishing *Fragment on Government*, or *A Comment on the Commentaries* (1776), against Blackstone's conception of perfection of Eng. constitution; *Principles of Morals and Legislation* came out 1789, *Defence of Usury*, 1816; established *Westminster Review*, 1823. B. belonged to rationalist-utilitarian school of philosophy (himself inventing phrase *utilitarian*), and adopted as motto, 'the greatest happiness of the greatest number.' His *Principles of Penal Law* foreshadowed modern principles of punishment; see Sir Leslie Stephen's *Jeremy Bentham*.

BENTHAMIA, in botany, species of Cornaceae; the *B. fragifera* of Nepal bears stone fruit.

BENTHOS, marine plants and animals which live on the sea-floor, attached there, or capable of only limited wanderings.

BENTINCK, family name of earls and dukes of Portland (q.v.).

BENTINCK, WILLIAM CAVENDISH (1774-1839), 2nd s. of 3rd Duke of Portland, introduced reforms into Indian administration, and became first Governor-General of India (1833-36).

BENTINCK, WILLIAM GEORGE FREDERICK CAVENDISH (1802-48), commonly called LORD GEORGE BENTINCK, younger s. of 4th Duke of Portland; prominent Whig politician; promoted enfranchisement of Irish and Jews, but opposed Free Trade, and was formidable opponent of Peel; out great figure in sporting world.

BENTIVOGLIO, GIOVANNI (1443-1508), tyrant of Bologna deposed by French.

BENTIVOGLIO, GUIDO (1579-1644), Ital. cardinal, diplomatist, and author.

BENTLEY, RICHARD (1662-1742), Eng. scholar; b. Oulton (Yorks); ed. Wakefield and Cambridge; master of Spalding Grammar School (1682), but soon resigned to become tutor to the son of Dr. Stillingfleet, Dean of St. Paul's. He remained with this family for six years, and upon the dean being app. bp. of Worcester, accompanied his pupil to Oxford, where he became noted for his learning, and delivered the Boyle lectures on the *Evidences of Natural and Revealed Religion*; having taken his degree at both univ's, he took holy orders, with a view to ecclesiastical preferment. His letter to Dr. Mill, editor of the Gk. chronicle John Malalas, in 1691, and his famous *Dissertation on the Epistles of Phalaris*, established his reputation as the greatest scholar of his age. In 1700 he was app. Master of Trinity Coll., Cambridge; in 1717 Regius Prof. of Divinity. At Cambridge he was constantly engaged in litigation or dispute either with the authorities or some individual. His various scholastic controversies gave rise to Swift's *Battle of the Books*, and, having incurred the enmity of Pope, he was satirised in *The Dunciad*. Besides writings already referred to, B. pub. various annotated editions of the classics, including Terence and Horace, and of Milton's *Paradise Lost*.

Monk, Life (1833); Sir R. Jebb, *Life* (1882); vol. ix. of *Cambridge History of Lit.*

BENTLEY, RICHARD (1794-1871), Eng. publisher; originally a printer; began business as pub-

lisher in conjunction with Henry Colburn, 1829; *B.'s Miscellany*, which first appeared 1837, was edit. for three years by Charles Dickens.

BENTON HARBOR (42° 5' N., 86° 30' W.), city, Michigan, U.S.A.; mineral springs. Pop. 9185.

BENTON, THOMAS HART (1782-1858), Amer. statesman; senator for Missouri, 1821-51, and leader of Democratic party. B.'s great interest was expansion of U.S.A. westward, advocating annexation of Oregon and Texas; disapproved of slavery, and lost his seat in Senate for refusing to forward grievances of Southerners.

BENUE (7° 50' N., 6° 40' E.), river, W. Africa; principal tributary of Niger.

BENYOWSKY, MAURICE AUGUSTUS, COUNT DE (1741-86), Hungarian who occupied Madagascar for France.

BENZALDEHYDE, OR OF BITTER ALMONDS (C_6H_5CHO), most simple aromatic aldehyde, colourless liquid smelling of bitter almonds, B.P. 179.1°. Theoretically and practically important because of derivatives used in production of artificial indigo.

BENZENE, BENZOL (C_6H_6), colourless, mobile, highly refracting, volatile liquid having inflammable vapour; M.P. 5.4°, B.P. 80.4°; Sp. G. 0.899 at 0°; solvent for fats, resins, etc.; important in dyeing industry for preparation of its derivatives; of great theoretical interest, its molecule being formed by a ring of six carbon atoms, to each of which one hydrogen atom is attached; the derivatives are termed aromatic or benzenoid compounds. See CHEMISTRY.

BENZIDINE, Di-para-diamino-diphenyl ($NH_2.C_6H_4.C_6H_4.NH_2$), di-acid base crystallising in scales; M.P. 122°, B.P. 360°; of technical importance in preparation of cotton dyes.

BENZOIC ACID (C_6H_5COOH), aromatic acid, volatile, crystalline solid; M.P. 121.4°; B.P. 249.2°; prepared from coal-tar toluene. B. a. and its compounds are used medicinally as antiseptics, and as stimulating expectorant in bronchitis and phthisis.

yellowish from *Styrax benzoin*, used in preparation of antiseptic ointments and the antiseptic tincture (friar's balsam), and as incense.

BENZOLINE—Benzene (q.v.).
BENZOPHENONE (*Diphenyl Ketone*) ($C_6H_5.CO.C_6H_5$), a dimorphous aromatic ketone; B.P. 306°. Its derivative, *Tetramethyl-diamido-benzophenone*, $CO[C_6H_4.N(CH_3)_2]_2$, is important technically in dye-stuff manufacture.

BENZYL ALCOHOL, BENZYL CARBINOL ($C_6H_5.CH_2OH$), colourless aromatic liquid; B.P. 206°.

BEOTHY, ODON (1796-1854), Hungarian soldier and distinguished Liberal politician.

BEOWULF, earliest Eng. epic, in which are incorporated many Teutonic traditional stories; considered the parent of modern literatures; it probably first took shape in V. or early VI. cent., but date and, still more, place of action are matters of discussion; it is in West Saxon dialect, but possibly translation from Northumbrian; theory that Boulby, Yorks, was 'B's by' has been heatedly advocated and rejected; the single MS. containing the story is in the Cottonian Collection (Vitellius, A 15), Brit. Museum, and was probably copied out c. 1000 A.D. The following is a brief outline of the epic. Beowulf, nephew of the Swedish king, Hygelac, hears of the ravages committed by Grendel, a monster in human form, at the court of King Hrothgar. He therefore sets sail for 'Seoland' (wherever that may have been) with fourteen companions, is kindly received by Hrothgar, and, lying in wait by night for the monster, succeeds, after a fierce struggle, in tearing off its arm. By means of bloodstains Grendel is traced to his lair, which lies beneath a distant mere. The night following the king's hall is visited by Grendel's mother, who carries off a noble; B. follows, plunges into the mere, fights with, and kills, the female monster, cuts off the head of the dead Grendel, and returns in triumph.

Handsomely rewarded by Hrothgar, B. returns to his own land, succeeding eventually to his uncle's kingdom, and reigned happily for some fifty years. At the end of that time a fiery dragon begins to lay waste his country; B., now an old man, goes forth against the monster, which he succeeds in slaying, but also receives his own death-wound. See *EPIC, THE*.

Eng. prose, trans. by J. R. C. Hall, 1911; verse by Morris.

BÉRANGER, PIERRE JEAN DE (1780-1857), Fr. song-writer; b. Paris. When on the brink of starvation (1802) he besought the patronage of Lucien Bonaparte, who made him a small allowance; later he procured a clerkship in the univ. Between 1808-12 were written and handed about, *Les Gueux*, *Le Bœuf Gras*, and the *Petit Homme Gris*; while his *Roi d'Yvetot* (1813) made his name familiar throughout France. In 1815 his songs were collected into a vol., and in 1821 a second vol. appeared, for which B. was imprisoned for three months. In 1825 *Chansons Nouvelles* appeared, and in 1828 *Chansons Inédites*, for the publication of the latter of which, containing his democratic and anti-papal views, he was fined 10,000 francs and imprisoned for nine months. *Dernières Chansons*, his last vol., was pub. in 1857. His songs were witty, full of high feeling and pathos, and by them B. acquired a great political influence and an unrivalled hold on the hearts of the Fr. people.

BERAR, or **HYDERABAD ASSIGNED DISTRICTS** (21° N., 77° E.), one of Central Provinces of India, E. of Bombay; the dominion of the Nizam; formed part of dominions of Mahratta Rajah of Nagpur; assigned by Nizam to Brit. government, by treaties of 1853 and 1861; since 1903 under administration of commissioner-general for Central Provinces; fertile plateau; grain, cotton; area, 17,711 sq. miles. Pop. 2,762,418.

BÉRARD, JOSEPH FRÉDÉRIC (1789-1828), Fr. physician and philosopher; pub. *Doctrines médicales de l'école de Montpellier* (1819) and *Doctrines des rapports du physique et du moral* (1823).

BERAT (40° 44' N., 19° 59' E.), fortified town, vilayet Jannina, Albania; wine. Pop. 10,000.

BERAUN (49° 47' N., 14° 3' E.), manufacturing town, Bohemia, Austria. Pop. 9693.

BERBER (17° 56' N., 34° E.), town (and province), Anglo-Egyptian Sudan; on E. bank Nile; commercial centre. Pop. 10,000.

BERBERA (10° 30' N., 45° E.), chief seaport town, Somaliland, N.E. Africa; annual fair of inland tribes, Oct. till April, attended by 20,000 persons. Pop. c. 3500.

BERBERINE (C₂₀H₁₇NO₄), yellow, crystalline, solid alkaloid occurring in *Berberis* and other plants.

BERBICE (6° 10' N., 57° 30' W.), district, Brit. Guiana, S. America. Pop. 40,000.

BERCHEM, NICOLAAS, BERGHEM (1620-83), Dutch artist; b. Haarlem; much esteemed for his landscapes, some of which have been engraved by John Vischer; works in Amsterdam Museum, and at St. Petersburg.

BERCHTA, BERTA, figure of S. Ger. mythology; mentioned XIV. cent.; name still used to frighten children who misbehave.

BERCHTESGADEN (47° 38' N., 13° E.), town, Bavaria; salt; wood-carving; summer resort.

BERCK (50° 24' N., 1° 34' E.), watering-place, Pas-de-Calais, France; fisheries. Pop. c. 8000.

BERDICHEV (49° 53' N., 28° 35' E.), town, Kiev, Russia; silk, iron. Pop. c. 54,000.

BERDYANSK (46° 40' N., 36° 52' E.), port, Sea of Azov, Russia; grain. Pop. c. 27,000.

BEREA (37° 35' N., 84° 20' W.), town, Kentucky, U.S.A.; college; also suburb of Durban. Pop. 1520.

BEREANS, XVIII.-cent. Scot. sect which resisted everything save Biblical authority.

BERENGAR I., king of Italy (887-924); crowned emperor, 915; murdered after life of warfare; his grandson, **B. II.** (d. 968), was crowned 950; died prisoner of Emperor Otto I.

BERENGARIA OF NAVARRE, m., 1191, Richard I. of England.

BERENGARIUS, see **BÉRANGER DE TOURS**.

BERENGER DE TOURS, **BERENGARIUS** (908-1088), Fr. theologian who denied transubstantiation and founded sect condemned by several councils.

BERENICE (23° 53' N., 35° 34' E.), ancient seaport, W. of Red Sea, Egypt.

BERENICE, name of several Egyptian and Jewish princesses, one of whom was mother of Ptolemy Philadelphus, another his dau.; another was dau. of Ptolemy Auletes and elder sister of the notorious Cleopatra; still another B. was dau. of Salome, wife of Aristobulus and sister of King Herod I.

BERESFORD, LORD CHARLES WILLIAM DE LA POER (1846-), Eng. admiral and politician; 2nd s. of 4th Marquess of Waterford; b. Ireland; famous for gallantry at bombardment of Alexandria (1882); commanded Channel Squadron (1903-5); admiral (1906); Commander of Mediterranean Fleet (1905-7); Commander of Channel Fleet (1907-9); M.P. (Unionist) for Portsmouth since 1910; keen naval critic and leader of the 'big navy' party.

BERESFORD, WILLIAM CARR BERESFORD, VISCOUNT (1768-1854), Eng. general; illegitimate s. of George de la Poer Beresford, 1st Marquess of Waterford; distinguished in Peninsular War; cr. Baron of Albuera and Dungarvan, 1814; viscount, 1823; general, 1825.

BEREZINA (52° 50' N., 29° 30' E.), river, Minsk, Russia, tributary of Dnieper; noted for disastrous passage of Napoleon's army in retreat from Moscow, 1812.

BEREZNA.—(1) (51° 33' N., 31° 44' E.) town, Tchernigov, Russia. Pop. 9921. (2) (51° N., 26° 43' E.) town, Polhynia, Russia.

BEREZOV (63° 42' N., 65° 38' E.), town, Tobolsk, Russia; furs.

BEREZOVSK (56° 53' N., 60° 44' E.), small town, Perm, Russia; centre of goldfields.

BERG (48° 55' N., 8° 4' E.), former duchy of Germany; right bank of Rhine; ceded to Prussia, 1815.

BERGA (42° 4' N., 1° 47' E.), town, Spain. Pop. 5465.

BERGAMA (39° 7' N., 27° 14' E.), town, Anatolia, Asiatic Turkey. Pop. 20,000.

BERGAMO (45° 42' N., 9° 41' E.), city and province, Italy; formerly belonged to Venice; cathedral; silks. Pop. (1911) c. 56,000; province, c. 510,000.

BERGAMOT, OIL OF, a limpid, greenish-yellow fragrant fluid, used in perfumery and microscopical preparations.

BERGEDORF (53° 28' N., 10° 12' E.), town, Hamburg territory, Germany; market gardens. Pop. 10,000.

BERGEN (60° 26' N., 5° 22' E.), seaport and fortified town at head of Byfjord, Norway; founded 1070; formerly principal Nor. port; second largest town; cathedral, museum, and churches; tourist centre; birthplace of Ole Bull and Edvard Grieg; fish and fish products. Pop. (1911) c. 77,000.

BERGEN-OP-ZOOM (51° 30' N., 4° 18' E.), town, N. Brabant, Holland; pottery; former fortress; attacked by British, 1814. Pop. 14,230.

BERGERAC (44° 52' N., 0° 29' E.), town, Dordogne, France; ancient Huguenot stronghold; wines. Pop. c. 16,000.

BERGERAC, see **CYRANO**.

BERGHAUS, HEINRICH (1797-1884), Ger. geographer; compiler of the *Physikalischer Atlas* (1838-48) and numerous other cartographical works.

BERGE, THEODOR (1812-81), Ger. philologist; pub. *Poeta Lyrici Graeci* (1843), *Griechische Literaturgeschichte* (1872-87), and editions of Anacreon and other classical authors.

BERGMAN, TORBERN OLOF (1735-84), Swed. naturalist and chemist.

BERGSCHRUND, cleft between upper part of glacier or snowfield and steep mountain-side.

BERGSON, HENRI (1859—), Fr. philosopher, prof. at the Collège de France, and exponent of the *Philosophy of Change*, according to which previous systems of thought attach too much importance to knowledge. Life is first to be explained, and gives a key to the nature of knowledge. Knowledge has a value in serving life. The intellect and instinct are two modes of the mind's activity, developed along different lines of evolution, to serve the needs of the organism. But in 'intuition' we have a power of apprehending reality directly, a sympathetic attitude by which we seem to enter into it. B. is first to recognise intuition as a philosophical instrument.

Henri Bergson, by H. Wildon Carr (1912).

BERGUES (50° 59' N., 2° 25' E.), town, Nord, France. Pop. c. 5000.

BERHAMPUR (24° 5' N., 88° 10' E.), town, Murshidabad dist., Bengal, India. Pop. c. 25,000.

BERHAMPUR (19° 18' N., 84° 48' E.), town, Madras presidency, Brit. India; silk weaving. Pop. c. 25,000.

BERI-BERI, disease occurring in Japan, Korea, southern China, Malay Peninsula, Burma, Ceylon, East Africa, and the West Indies, and carried by ships to different parts of the world; not contagious, but breaks out from time to time in the same localities, and is supposed to be due to a fungus infecting rice. There are two types of the disease, which is sometimes of prolonged duration, one *paralytic*, the symptoms beginning in legs, which are tender on pressure, and extending to other parts of body, and the other *oedematous*, in which tissues, especially of legs, are swollen and infiltrated with fluid, and there is difficulty in breathing; treatment consists in isolation, general hygiene, and treating the symptoms, heart weakness, etc., as they appear.

BERING, VITUS, BEHRING (1680-1741), Dan. discoverer after whom are named Bering Sea (55° N., 180° E.), part of Pacific Ocean between Aleutian Islands and B. Strait; *Bering Strait* (65° N., 169° W.), channel connecting Arctic and Pacific Oceans, and separating Alaska and Siberia; and *Bering Island* (55° 17' N., 165° 26' E.), island, S.W. part, B. Sea, where B. died.—*Bering Sea Arbitration* ended fishery dispute between Great Britain and U.S.A.; Brit. ships on seal-catching expeditions captured (1886-87) by American revenue officials on ground (1) of trespassing on Alaska territory; (2) America's sole right of seal-fishing in Bering Sea as purchaser of this territory from Russia which had previously had this right; and (3) necessity of protecting seals; arbitrators appt., 1892; award given in favour of Great Britain, 1893.

BERJA (36° 48' N., 2° 56' W.), town, Almeria, Spain; lead-mines. Pop. 13,224.

BERKA (50° 55' N., 11° 20' E.), watering-place, Saxe-Weimar, Germany; sulphur baths.

BERKELEY.—(1) (37° 28' N., 122° W.) city, California, U.S.A.; seat of California univ. Pop. 40,434. (2) (51° 42' N., 2° 28' W.) market town, B. Vale, near Severn, Gloucestershire, England; castle built, 1100-54; cheese.

BERKELEY FAMILY.—One Roger, who held lands in England in 1086, then held Berkeley, County Gloucester, at farm from the Crown, and afterwards took his name from the place. The B's were summoned to Parliament as barons by writ from 1295. **WILLIAM, LORD DE B.** was cr. viscount, 1481; Earl of Nottingham, 1483; Marquis of B., Jan. 1488-89—dignities which ceased at his death without issue. **GEORGE, LORD DE B.** was cr. Viscount Dursley and Earl of B., 1679—dignities which became dormant on death of the 5th earl, 1810.

BERKELEY, GEORGE (1684-1753), Irish philosopher; b. Kilkenny; ed. Trinity College, Dublin; resolving to establish centre of Christian civilisation in Bermuda, he went to Rhode Island (1728), but, as ed grant was not paid, he returned (1731); bp. of , 1734, he worked zealously for people's welfare; d bishopric, 1752, and died at Oxford. B. wrote on economics, *Querist*, anticipating Adam Smith, on

therapeutics, *Siris*, with a metaphysical turn, but is chiefly noted for *Essay towards a New Theory of Vision*, a *Treatise on the Principles of Human Knowledge*, in which he advanced the theory that the actuality of the seen world depends on its being perceived, and that this involves the assumption of creative Eternal Reason. See IDEALISM.

BERKELEY, MILES JOSEPH (1803-89), Eng. botanist; founder of Brit. mycology (scientific Fungus study).

BERKELEY, SIR WILLIAM (c. 1608-77), Brit. gov. of Virginia.

BERKHAMSTEAD, GREAT BERKHAMSTEAD (51° 46' N., 0° 34' W.), market town, Hertfordshire, England. Pop. (1911) 7302.

BERKSHIRE (51° 28' N., 1° 15' W.), county, England, lying S. of Thames, which separates it from Buckinghamshire and Oxfordshire; borders also on Hampshire, Surrey, Wiltshire; eastern part contains Bagshot Heath and Windsor Park, and is well wooded with oak, beech, ash, elder, hazel; crossed by rivers Ock, Kennet, Loddon, and by two canals. Vale of Ock is called Vale of White Horse, from gigantic figure of horse made (according to tradition, to commemorate battle of Ashdown, 871) by removing turf from chalk of downs; in this district are the famous Wayland's Smithy, and Cumnor (*q.v.*). County is excellent agricultural district, dairy-farming and grazing successfully carried on; produces Gloucester cheese. Kennet is famous for trout and eels; county town, Reading, famous for biscuits. There are three parliamentary divisions, each returning one member, and seven municipal boroughs, of which Windsor and Reading each return one member; area, 721 sq. miles. Pop. (1911) 303,428. See Victoria County History—*Berkshire*.

BERKSHIRE HILLS, hill district, watered by four rivers, in W. Massachusetts, U.S.A.; famous summer resort.

BERKSHIRE, THOMAS HOWARD, 1ST EARL OF (1587-1669), Eng. soldier; fought on king's side in Civil War.

BÉRLAD (46° 14' N., 27° 43' E.), town, Rumania. Pop. 24,484.

BERLICHINGEN, GOETZ (or GOTTFRIED) VON (1480-1562), Ger. knight called *Iron-Hand*, cousin of Conrad von Berlichingen; lost hand in war and wore iron hand, still preserved; regarded as last knight of chivalry.

BERLIN (52° 32' N., 13° 25' E.), city, capital of Prussia and of Ger. Empire, on Spree. B. has been residence of Hohenzollern family since middle of XV. cent.; sacked several times during Thirty Years War; suffered in Seven Years War and Fr. Revolutionary wars. Its importance dates from time of Great Elector, Frederick William, by whom modern town was laid out. His a., Frederick I., caused construction of Friedrichstadt, 1688; enormous building activity since 1870, due partly to stimulus of successful war, partly to ideas gleaned in Paris during the occupation.

Height is c. 100 ft. above sea; site of B. is level; well laid out, with many fine streets; third town in size, and perhaps cleanest in Europe. The river Spree divides city into two parts; on its right bank are oldest parts, Old B., with the *Rathaus*, and, finally united to it XV. cent., Old Köln, with royal palace, on an island. Seventy-five per cent. of buildings are modern, a large proportion being very good modern Renaissance work showing Fr. influence; principal old buildings are Kloster Kirch and three other churches. Principal street is famous Unter den Linden, over a mile long, formed by three avenues of lime trees; it contains numerous public buildings, government offices, statues, etc., and claims to be finest street in Europe; it is entered at W. end by Brandenburger Thor, celebrated gateway, copied from Propylæa, Athens, leading to the chief park, the Tier-Garten; at E. end are the Opern Platz, filled with monuments, and Lust-Garten, near which is royal palace, an enormous

